LOCK OUT / TAG OUT PROGRAM

Per OSHA 29 CFR 1910.147 and MIOSHA Part 85
The Control of Hazardous Energy Sources

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TABLE OF CONTENTS

INTRODUCTION

PURPOSE

This document establishes the Wayne State University (WSU) requirements, procedures, and administrative responsibilities for the Control of Hazardous Energy – Lockout/Tagout (LOTO) Program. The program serves to provide safety requirements for the lockout of energy-isolating devices whenever maintenance or servicing is done on systems or equipment. It shall be used to ensure that the system or equipment is stopped, isolated from all potentially hazardous energy sources, and locked out before personnel perform any servicing or maintenance where the unexpected energization, start-up, or release of stored energy could cause injury to employees, students, or visitors.

SCOPE

The LOTO Program applies to personnel (including WSU employees, students, contractors, and others) who are exposed to, work with, or supervise operations involving work with hazardous energies at the WSU main campuses, satellite locations, and related WSU facilities and operations.

EXCEPTIONS

This program does not apply to:

- Controlling hazardous energy in installations for the exclusive purpose of power generation, transmission, and distribution, including related equipment for communication or metering.
- Minor tool changes and adjustments, and other minor servicing activities, which take place during normal production operations, so long as they meet the following requirements:
    - The work is routine, repetitive, and integral to the use of the equipment or machinery for production, and
    - The work is performed using alternative measures, such as machine guards, which provide effective protection against hazardous energy sources.
- Work on cord and plug connected electric equipment when unplugged, no remaining hazard exists, and the plug is under exclusive control of the person performing the work.

DEFINITIONS

Affected Employee: An employee who uses and operates a system, equipment, or machine which requires locking-out or tagging-out during servicing or maintenance, or whose job requires them to be in the area where servicing or maintenance is being performed. An affected employee does not service or maintain machinery or perform lock/out tagout/out activities. Affected employees must be trained and able to recognize the energy-control procedure being used, understand the purpose of the procedure and understand the importance of not tampering with lockout tagout devices or not starting or using the equipment that has been locked-out or tagged-out.

Authorized Employee: An employee who is responsible for implementing the energy control procedures outlined in this program or a person who locks out or tags out a system, machine, or equipment in order to perform repairs, servicing, or maintenance. Authorized employees are trained and have the necessary skills for the safe application, use and removal of energy-isolating devices. Their training includes hazardous energy source recognition; types and magnitude of the hazardous energy sources in the workplace; and energy control procedures, including methods and means to isolate and control these energy sources. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered in this policy.

Capable of Being Locked Out: An energy isolating device is capable of being locked out if it 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. 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 that physically 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 by which the conductors of a circuit can be disconnected from all ungrounded supply conductors, and, in addition, no pole can be operated independently; a line valve; a block; and any similar device used to block or isolate energy. Push buttons, selector switches and other control circuit type devices are not energy isolating devices.

Energy Source: Any source of electrical, mechanical, hydraulic, pneumatic, chemical, thermal, or other energy.

Hot Tap: A procedure used in the repair, maintenance and services activities which involves welding on a piece of equipment (pipelines, vessels or tanks) under pressure, in order to install connections or appurtenances. It is commonly used to replace or add sections of pipeline without the interruption of service for air, gas, water, steam, and petrochemical distribution systems.

Lockout: The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

LOTO: An acronym for “Lockout/Tagout”.

Lockout Device: A padlock, with identification, specially designed for equipment system lockout, to hold an energy isolating device in a safe position and prevent the energizing of a system, machine, or equipment.

Group Lockout Device: A lockout device, such as a hasp, that accepts multiple padlocks used when more than one worker needs to lock out a system or equipment energy source.

Normal production operations: The utilization of a machine or equipment to perform its intended production function.

Qualified Person: One who has received training in and has demonstrated skills and knowledge in the construction and operation of electric equipment and installations and the hazards involved.

Servicing and/or Maintenance: Workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include repairs, 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.

Setting Up: Any work performed to prepare a machine or equipment to perform its normal production operation.

Tagout: The placement of a tagout device on an energy isolating device, in accordance with an established procedure, to indicate that the energy isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout Device: A device used when a lockout device will not isolate an energy source. The tagout device identifies the Authorized Employee and the nature of the work and is attached with a self-locking, non-releasable nylon cable tie substantial enough to prevent inadvertent or accidental removal.

RESPONSIBILITIES

OFFICE OF ENVIRONMENTAL HEALTH AND SAFETY (OEHS)

- The Director of OEHS has the ultimate responsibility for the program within the university.
- Overall administrative management, oversight and regulatory guidance, including interpretation of the processes and procedures outlined in this program are aligned with MIOSHA Part 85.
- Review and revise this document periodically and upon notice of the need for changes. Post the most recent edition of this program on the OEHS website.
- Coordination of the requirements and implementation of the program with the University's Deans, Department Chairs, Building Coordinators, and Facilities Management Senior Directors of Design and Construction Services, Hard and Soft Services, and Enterprise Risk Management.
- External communication and reporting concerning the status of this program with State and Federal agencies.
- Administration of the safety training database; including specific training, retraining and certification for "authorized" and "affected" employees.
    - Includes scheduling initial and annual classroom or online instruction for all "authorized" and "affected" employees.
    - Verification and certification of hands-on identification of hazardous energy sources and hazardous energy and application of proper control devices for authorized employees by a subject matter expert after classroom instruction.
    - Maintain records of LOTO training. Provide certification of authorized employees after completion of all classroom and hands-on verification training and annual retraining.
    - Provide reports on training compliance for authorized and affected employees.
- Provide administrative and management control of:
    - A repository or database of official machine and equipment specific lock-out / tag-out procedures. Ensure accessibility for authorized personnel to all current approved LOTO procedures.
    - Update and approval process for lock-out / tag-out documents, procedures, and process revisions campus wide.
    - Provide a template for machine and equipment specific procedures for control of sources of hazardous energies. See Appendix B for a template for writing a draft procedure.
        - Provide guidance for developing machine/equipment/system specific LOTO procedures.
    - Develop a visual management and posting standard for equipment and machine related shut down and control procedures to be posted at the equipment or machine.
        - Post all current approved LOTO procedures on or next to the associated equipment.
        - Coordinate with authorized personnel to identify and label energy control points.
    - List of approved hazardous energy control devices and procedures for:
        - Electrical

- Mechanical
- Hydraulic
- Pneumatic
- Chemical
- Environmental
- Thermal (heat and cold)
- Pressurized
- Motion
- Pressure
- Engulfment
- Laser
- Radiation

- Provide oversight and approval of an exceptions process that includes:
  - Determining if a piece of equipment meets the exception requirements indicating that a written procedure is not needed. See Appendix A Written Procedure Exception Form.
  - A documented emergency lock or device removal process. See Appendix D.
- Provide oversight and approval of university standards for lockout devices (hardware) and tagout tags that includes:
  - Visual management – color assigned to each authorized group and labeling of locks and tags to be used exclusively for lockout/tagout activities.
  - Approved hasp standards
  - Approved lockout device standards
  - Approved tagout tag standards. See Appendix F for examples.
- Periodically audit compliance with this program through inspections in coordination with a departmental authorized representative.

DEPARTMENT MANAGER/SUPERVISOR

- WSU department deans/directors/managers/supervisors (including supervisory staff in academic departments who oversee students) are included in this group.
- Supervisors of authorized employees who perform service and maintenance activities within the scope of this program must participate in required training.
- Supervisory staff and academic personnel who oversee students performing service and maintenance activities within the scope of this program must:
  - be authorized employees,
  - directly supervise students designated as authorized employees, and
  - comply with all sections in this program.
- Communicate the application and removal of LOTO devices to individual departmental personnel that may use or be impacted by LOTO operations (affected individuals).

- Identify departmental personnel to receive the required classroom and on-the-job training to be designated as authorized employees. Only properly trained and identified authorized employees may utilize LOTO procedures.
- Ensure authorized personnel are provided effective information, resources and training on hazardous energies and methods for safe LOTO control in their work area at the time of initial assignment or upon addition or changes of new machine(s), equipment, processes, departmental procedures, or the LOTO Program.
- Provide on-the-job training to departmental authorized employees using the Employee On- The-Job-Training Checklist (Appendix E) and specific LOTO procedures.
- Provide to, and maintain documentation of, which authorized personnel have been issued standardized energy isolating equipment, standardized locks, tags, and resources to control LOTO hazards.
- Maintain a means of communicating to employees on other shifts why locks have been attached.
- Ensure equipment specific LOTO procedures are developed utilizing Appendix B LOTO Draft Procedure Form.
- Provide guidance for developing machine/equipment/system specific LOTO procedures.
- In conjunction with OEHS, approve written LOTO procedures.
- Coordinate with authorized personnel to conduct Periodic Inspections of LOTO procedures to assure compliance of LOTO activities. This may be completed during LOTO operations. (Appendix C Lockout/Tagout Periodic Inspection Form)
- In conjunction with OEHS and FP&M, provide authorization for abandoned/emergency lock removal following procedures outlined in this document and by completing Appendix D Abandoned/Emergency Lock Removal Form.
- Enforce the compliance of procedures by all affected and authorized employees.

WSU PROJECT MANAGERS

WSU Project Managers or individuals responsible for external contractors or vendors that will be conducting LOTO procedures while on WSU property must comply with the following:

- Understand the role and responsibilities of contractors or vendors as outlined in this document and communicate the requirements to the contractors or vendors.
- Communicate energy hazards that may not be evident to the contractor or vendor.
- Where LOTO activities conducted by contractors or vendors may or have the potential to create an exposure for WSU employees, assure:
    - An FP&M District Associate Director/Project Manager/Supervisor clearly notifies WSU affected employees of hazards, the intended LOTO operations of the contractor or vendor, methods to minimize exposures, and the equipment or processes that will be impacted during the LOTO activities.
    - That all involved WSU Project Managers, authorized employees, contractors, and vendors participate in a pre-planning meeting prior to performing the LOTO work.
    - WSU authorized employees working with or alongside contractors must follow the requirements of this program.

- Coordination between WSU Project Managers, contractors, and vendors on all LOTO projects.

- Maintain records of periodic inspections according to the Recordkeeping section of this document.

AUTHORIZED INDIVIDUALS

- Comply with all WSU LOTO procedures described in this document and in written machine/equipment/system specific LOTO procedures.
- Consult with Associate Director/Project Manager/Supervisor, other knowledgeable authorized personnel, or OEHS whenever there are any questions regarding the application of lockout/tagout procedures.
- When unfamiliar with the equipment to be locked out, consult with someone knowledgeable of the equipment and procedure. Talk to the equipment operator, supervising engineer, or anyone else who, by training and experience, has a good working knowledge of the operation that needs LOTO.
- Use issued standardized energy isolating devices, standardized locks, or tags for personal protection in WSU facilities and operations and use only for machine/equipment/system LOTO purposes.
- Do not remove lockout/tagout devices or attempt to operate systems or equipment locked-out or tagged-out except as outlined in this policy.
- Help with developing machine/equipment/system specific written LOTO procedures.

EXTERNAL CONTRACTORS AND VENDORS

- Must have a LOTO Program or written documentation that complies with the requirements of MIOSHA Part 85.
- Shall inform and provide WSU Project Manager or WSU personnel who hire external contractors of the following:
  - LOTO procedures and/or LOTO Program,
  - Actual and potential energy hazards of the planned work, and
  - Anticipated dates and times of LOTO activities.
- Contractor/vendor employees scheduled to perform LOTO activities must be trained to meet the requirements of MIOSHA Part 85 and understand the hazards of WSU equipment scheduled for service and maintenance.
- Must coordinate with WSU personnel to notify all affected and other employees whose work operations are or may be in an area where LOTO procedures will be utilized.
- Conduct or participate in pre-planning meetings that include WSU and contracted authorized employees prior to conducting LOTO activities.
- When WSU employees are involved in LOTO activities where a contractor is involved:
  - An Associate Director/Project Manager/Supervisor from WSU and the contractor must coordinate and communicate the LOTO procedures for the planned activities.
  - The pre-planning meeting(s) must be clearly documented to address the details of the planned LOTO activities and provide guidance for notifying all impacted personnel.

- The documentation will be maintained by the WSU Project Manager or the WSU personnel responsible for the hired contractor.

AFFECTED INDIVIDUALS

- Participate in training on the purpose and use of LOTO procedures.
- Do not attempt to restart or reenergize equipment or machines that have been locked or tagged out for LOTO purposes.
- Report incidents, conditions, or work practices relating to LOTO believed to be a health or safety hazard to the immediate supervisor.

PROCEDURES AND APPLICATION

All authorized and affected personnel are required to comply with the restrictions and limitations imposed upon them during the use of lockout/tagout. Authorized personnel are required to perform LOTO in accordance with this procedure.

All authorized and affected personnel, upon observing a system or piece of equipment which is locked out to perform servicing or maintenance, shall not attempt to start, energize, or use that system or equipment.

In order to provide a safe working environment for all WSU personnel and the University community, the following general LOTO policies apply to all hazardous energy operations:

- All authorized personnel will use proper lockout/tagout procedures when operating, maintaining, servicing, or repairing machines/equipment/systems. Maintenance or repairs will not start until all sources of energy have been properly locked out and/or appropriately tagged.
- Lockout devices, locks, and tags will not be removed until the equipment and the surrounding area has been returned to a safe operating condition.
- If LOTO must continue beyond the end of a shift, authorized personnel must notify the appropriate Supervisor/Manager before leaving equipment locked/tagged out when departing the job site. The Supervisor/Manager must communicate the status of the LOTO to the next shift authorized personnel.
- Authorized personnel will personally remove their own lockout locks and tags. Personnel will not remove another employee's or a contractor's lockout lock and tag except as outlined in the section Emergency Restoration Procedure/ Authorized Personnel Not Available.
- All new equipment will be installed with an appropriate lockout device. Further, appropriate lockout devices will be installed whenever existing equipment undergoes major renovation, modification or repair, or is replaced. The lockout device will be installed in a location clearly visible to an individual repairing, maintaining, or operating the equipment.

Note: For certain high-risk, non-standard conditions, or complex LOTO situations, OEHS reserves the right to include an OEHS representative's LOTO device on a machine/equipment/system. This will be based on an assessment of the hazards and risks involved.

ENERGY SOURCES AND EQUIPMENT

Examples of energy sources that must be locked and tagged out include but are not limited to:

Chemical	Mechanical	Hydraulic
Electrical	Pressurized systems	Thermal
Gravity	Pneumatic	Water
Motion	Steam	

Examples of equipment, machines or systems that must be locked and tagged out include but are not limited to:

Automated machinery	Elevators	Pumps
Burner motors	Electrical equipment/ circuits	Steam valves/ lines
Cage washers	Heating, ventilation, and air conditioning equipment	Trash compactors
Compressor motors	Hydraulic systems	Vehicles
Dishwashers	Pneumatic lines	Water lines/ piping

LOCKOUT DEVICES AND TAGOUT EQUIPMENT

LOCKOUT DEVICE REQUIREMENTS

- **Durable:** Lockout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.
- **Standardized:** Lockout devices shall be standardized within the department in at least one of the following criteria: color; shape; or size.
- **Substantial:** Lockout devices shall be substantial enough to prevent removal without the use of excessive force or unusual techniques, such as with the use of bolt cutters or other metal cutting tools.
- **Identifiable:** Lockout devices shall indicate the identity of the employee applying the device(s), either by labeling directly on the device or by being accompanied with a tagout tag. An example of lockout device labeling and tagout tags can be found in Appendix F.

USE OF LOCKOUT DEVICES

- WSU Key/Lock Shop shall be responsible for issuing LOTO locks and hasps for all employees.
- Employees must present the WSU Key/Lock Shop with the proper approval documentation issued by OEHS before equipment will be issued.
- Authorized Building Engineers and all skilled trade workers (Carpenters, Electricians, Painters, Handymen, Plumbers, and Pipefitters) will be issued at least four (4) lockout lock and at least four (4) hasps. Additional lockout devices shall be made available based on individual responsibilities and machine lockout requirements.
    - Lockout devices are only issued to authorized employees once they have successfully completed training and performed a hands-on validation of the lockout / tagout procedures.
- Supervisors for research areas and other non-FP&M areas (e.g., academic machine shops, research labs, etc.) requiring LOTO shall acquire an appropriate number of lockout devices and locks relevant to the machines/equipment/systems in their areas from WSU Key/Lock Shop.
- Lockout devices and locks will be used only for lockout of equipment. They will not be used for any other purpose.
- Locks shall remain on equipment during service and maintenance operations. For guidelines on temporary removal, refer to Group Lockout/Tagout and Shift or Personnel Changes sections.
- Locks are required to be removed by the authorized personnel who applied the lock. Personnel will not remove another employee's or a contractor's lockout lock except as outlined in the section Abandoned/Emergency Lock Removal.

TAGOUT EQUIPMENT REQUIREMENTS

- WSU Key/Lock Shop shall be responsible for issuing LOTO tagout devices for all for all employees.
- Employees must present the WSU Key/Lock Shop with the proper approval documentation issued by OEHS before equipment will be issued.

- Tagout devices' print, and format shall be standardized for each department based on OEHS requirements.
    - The tag must be red, black, and white and contain the word "DANGER", consistent with OSHA CFR 1910.145 Specifications for accident prevention signs and tags standard.
    - The tag must provide space for indicating who applied the tagout device and date applied.
    - The tag must clearly warn against unauthorized operation of the equipment and removal of tagout device.
    - An example tagout device can be found in Appendix F.
- Authorized Building Engineers and all skilled trade workers (Carpenters, Electricians, Painters, Handymen, Plumbers, and Pipefitters) will be issued at least four (4) tagout devices.
    - LOTO tags are only issued to authorized employees once they have successfully completed training and performed a hands-on validation of the lockout / tagout procedures.
- Supervisors for research areas and other non-FP&M areas (e.g., academic machine shops, research labs, etc.) require OEHS approval for the use of tagout devices.
- Tags are to have the authorized personnel's contact information identified on the tag.
- Tags must be legible and understandable to all personnel.
- Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and shall include a legend such as the following: DO NOT START. DO NOT OPEN. DO NOT CLOSE. DO NOT ENERGIZE. DO NOT OPERATE.
- Tagout devices shall be constructed and printed so that exposure to weather conditions or wet and damp locations will not cause the tag to deteriorate or the message on the tag to become illegible.
- Tags shall not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.
- Tagout devices, including their means of attachment, shall be substantial enough to prevent inadvertent or accidental removal.
- Tagout device attachment means shall be of a non-reusable type, attachable by hand, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds and having the general design and basic characteristics of being at least equivalent to a one-piece, all environment-tolerant nylon cable tie.

USE OF TAGOUT EQUIPMENT

An approved tag must be applied to the hasp of each lockout device used for the lockout by the authorized personnel performing LOTO activities. The tag serves to notify affected employees and other personnel of the inherent danger and include but are not limited to the following legible information:

- Authorized personnel name
- Date(s) and time(s) of LOTO operations
- Phone number to reach authorized personnel in case of emergency.

Tagout Only Operation (When Equipment is Not Capable of Accepting a Lock)

NOTE: Where the equipment is capable of accepting a lock, a lock and tag must be used.

Tags are essentially warning devices affixed to energy isolation devices, and do not provide the physical restraint that is provided by a lock. Tags may promote a false sense of security, and their meaning needs to be understood. They are to be used only when locks are not feasible for isolating the energy source. Consult with your supervisor/team leader before using tags.

A tagout-only operation must be approved by appropriate WSU Deans/Directors/Managers/ Supervisors of the department and the following requirements shall be met:

- Procedure(s) are written, available, communicated, and used by the authorized personnel that provide equal protection as a lockout operation against potential re-energization.
- The tagout device must be attached at the same location that the lockout device would have been attached.
- The authorized personnel and supervisor must demonstrate that the tagout procedure will provide a level of safety equivalent to that obtained by using a lockout.
- The authorized personnel and supervisor must demonstrate full compliance with all tagout-related provisions of MIOSHA Part 85 and provide one of the following or other equivalent safety measures: removal of an isolating circuit element, blocking of a controlling switch, opening of an extra disconnecting device, or the removal of a valve handle to reduce the likelihood of inadvertent re-energization.
- When a tag is attached to an energy isolating device, it is not to be removed unless done so by the authorized person who placed it there, and it is never bypassed, ignored, or otherwise defeated.
- Personnel will not remove another employee's or a contractor's lockout tag except as outlined in the section Abandoned/Emergency Lock Removal.

PROCEDURE DOCUMENTATION

LOTO procedures shall be developed, documented, and utilized for the control of potentially hazardous energy when the employees are engaged in service or maintenance per the scope of this program.

An authorized person most familiar with the machine or equipment should be assigned the task of developing LOTO procedures.

Development of a LOTO procedure shall begin with an assessment of the machine/equipment/system to determine all potential hazardous energy sources, the safest shutdown order, and the appropriate lockout/tagout device(s) to use.

Appendix B: LOTO Draft Procedure Form should be used to assist in this assessment and for procedure development. When the need to update an existing LOTO procedure is identified or observed, the updated procedure shall be reviewed and approved according to this LOTO Program.

The approval of written procedures is the responsibility of OEHS and shall be conducted prior to the service and/or maintenance of equipment or processes.

Documented LOTO procedures must include and are not limited to:

- A specific statement of the intended use/purpose of the procedure.
- Specific procedural steps for shutting down, isolating, blocking, and securing machines or equipment to control hazardous energy.
- Specific procedural steps for the placement and removal; and
- Specific requirements for testing a machine or equipment to determine and verify the effectiveness of lockout devices, tagout devices, and other energy control measures.

Exception: The employer need not document the required procedure for a particular machine or equipment, when all of the following elements exist:

1. The machine or equipment has no potential for stored or residual energy or re-accumulation of stored energy after shutdown which could endanger employees.
2. The machine or equipment has a single energy source which can be readily identified and isolated (i.e., a single circuit breaker is the only source of energy, or a cord and plug connected equipment which the plug is under exclusive control of the worker).
3. The isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment.
4. The machine or equipment is isolated from that energy source and 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 servicing or maintenance (i.e., the equipment is unplugged, and you have continuous eye contact with that plug).
7. The servicing or maintenance does not create hazards for other employees; and

8. The employer, in utilizing this exception, has had no accidents involving the unexpected activation or re-energization of the machine or equipment during servicing or maintenance.

Appendix A: Written Procedure Exception Form can be used as a documented guide to determine if a written procedure is not necessary. OEHS is responsible for final approval of the LOTO exception.

LOCKOUT/TAGOUT REQUIRED PROCEDURE

Whenever it is necessary for WSU personnel to be involved in the service or maintenance of machines, equipment, or systems with a potential exposure to hazardous energy, these steps must be followed in order:

1. **Notify Affected Personnel**: Authorized personnel must communicate to affected personnel the equipment that will undergo service or maintenance.
    a. They shall be made aware of the energy source(s) being locked out or controlled and the anticipated duration of the shutdown.
    b. Authorized personnel will advise affected personnel on equipment that will or may be impacted by the shutdown, additional safety precautions to be considered, and the type of control device(s) being used.
        i. FP&M personnel will notify all affected personnel before locking-out or tagging-out any equipment.
        ii. LOTO work being performed by researchers on research related equipment or authorized personnel in academic areas conducting LOTO on machines/equipment/systems which do not affect building operations do not need to notify the Building Engineer.
        iii. For partial or full building disruptions, FP&M will be responsible for notifying the Building Coordinator.
2. **Preparation for Shutdown**: Before an authorized person turns off a machine or equipment, the authorized person shall have knowledge of the type and magnitude of the energy, the hazards of the energy to be controlled, and the method or means to control the energy.
    a. Authorized personnel shall refer to machine/equipment specific written LOTO procedures, if available.
    b. If written LOTO procedures are not available for the machine/equipment, then the authorized personnel shall conduct a hazard assessment using *Appendix B: LOTO Draft Procedure Form* to identify all potential energy sources and determine the appropriate order of LOTO to prevent hazardous conditions.
3. **Machine or Equipment Shutdown**: The machine or equipment shall be turned off or shut down using the normal stopping procedures established for the machine or equipment (depress stop button, open switch, close valve, etc.).
    a. An orderly shutdown must be utilized to avoid any additional or increased hazard(s) to employees as a result of the equipment stoppage.
4. **Machine or Equipment Isolation**: All energy isolating devices that are needed to control the energy to the machine, equipment or process shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s).
5. **Locking/Tagging**: Lockout or Tagout devices shall be affixed to each energy isolating device by each authorized personnel performing service and maintenance of machines and equipment.

a. Lockout devices, where used, shall be affixed in a manner that will hold the energy isolating devices in a "safe" or "off" position.

b. Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited.

6. **Stored or Residual Energy**: Following the application of lockout or tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, and otherwise rendered safe by methods such as grounding, repositioning, blocking, bleeding down, etc.

    a. Stored or residual energy may be such as that in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems, and air, gas, steam, or water pressure, etc.

    b. If there is a possibility of re-accumulation of stored energy to a hazardous level, verification of isolation shall be continued until the servicing or maintenance is completed, or until the possibility of such accumulation no longer exists.

7. **Verification of Isolation**: Prior to starting work on machines or equipment that have been locked out or tagged out, the authorized personnel shall verify that isolation and de-energization of the machine or equipment have been accomplished.

    a. Return the equipment to the “OFF” or “Neutral” position after verifying energy isolation.

    b. Authorized personnel who will be working on the locked out/tagged out machine or equipment and were not present during initial energy isolation verification should independently verify energy isolation before proceeding with the work.

Maintenance and service shall be performed only after all the above steps have been completed.

RESTORING POWER

Before lockout or tagout devices are removed and energy is restored to the machine, equipment, or system, per the documented LOTO procedure for re-energization by the authorized personnel, ensure the following:

- The work area shall be inspected to ensure that nonessential items have been removed and to ensure that machine or equipment components are operationally intact, including guards.
- Verify controls are in neutral.
- The work area shall be checked to ensure that all personnel have been safely positioned or removed.
- Each lockout and/ or tagout device shall be removed from each energy isolating device by the personnel who applied the device.
- If the authorized personnel are not available or the lockout/tagout device has become abandoned, then follow the Abandoned Lock or Tag/Emergency Removal procedure outlined in this document and complete the Appendix D Abandoned/Emergency Lock Removal Form prior to removing the lock and/or tag.
- After lockout and/or tagout devices have been removed and before a machine or equipment is started, affected personnel shall be notified that the lockout or tagout device(s) have been removed.
- Start up (reenergize) machine/equipment/system according to normal start-up procedures.

TEMPORARY REMOVAL OF LOCKOUT /TAGOUT DEVICES

In situations in which lockout or tagout devices must be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment, or component thereof, the following sequence of actions shall be followed:

- Clear the machine or equipment of tools and materials.
- Remove employees from the machine or equipment area.
- Notify affected personnel of the temporary start-up of the machine/equipment if it may impact them.
- Remove the lockout or tagout devices.
- Energize and proceed with testing or positioning.
    - Ensure methods are implemented to protect authorized and affected personnel from specific hazardous energy exposures prior to re-energizing equipment.
- De-energize all systems and reapply energy control measures per the documented LOTO procedure to continue the servicing and/or maintenance.

ABANDONED / EMERGENCY LOCK OR TAG REMOVAL

If a lock is abandoned or an emergency situation arises and the owner of that lock is not present, OEHS and an FP&M Associate Director must **both** approve the removal of the lock.

Only FP&M personnel are authorized to physically remove a lockout/tagout device.

At a minimum, this procedure shall include, but not be limited to, these actions by the supervisor:

- Verify that the owner of the lockout/tagout device is not on site.
- Make a reasonable attempt to contact the lockout/tagout device owner to inform them of the need to remove the lockout/tagout device.
- Review all available information (e.g., work orders) to determine the reason the equipment is locked/tagged out and if it is safe to remove the lock(s).
- Thoroughly inspect the equipment to determine it is safe to re-energize.
- Notify the lockout/tagout device owner of the removal upon their return to work.

This process must be documented by the department or unit supervisor by using *Appendix D: Abandoned/Emergency Lock Removal Form*.

GROUP LOCKOUT/TAGOUT

In situations where more than one authorized employee will be required to perform work on a system or equipment, group lockout or tagout devices shall be used in accordance with established procedures including but not limited to the following:

- **Management/Supervisor:** Assign designated authorized personnel (called the Primary Authorized Personnel) to take primary responsibility for the employees working under the protection of a group lockout/tagout device and shall coordinate affected work forces and ensure continuity of protection.

- In situations where group lockouts could extend beyond one shift or for several days, involving numerous employees or contractors, Management/Supervisor will designate a Primary Authorized Personnel for each shift.
- When contractors and WSU personnel collaborate on a project, each must assign a primary authorized employee who is responsible for providing communication and guidance for specific procedures and methods for protection from hazardous energy.

- **Primary Authorized Personnel:** Physically install a group lockout device as well as a personal lockout device prior to the attachment of other locks/tags.
  - The Primary Authorized Personnel shall verify LOTO steps have been taken, in accordance with the specific written energy control procedure, energy sources have in fact been isolated, and stored or residual energy has been relieved, disconnected, restrained, and otherwise rendered safe. This must be accomplished before authorized employees participating in the group LOTO affix their personal lockout device to the group LOTO box and before performing servicing/maintenance activities.
- **Authorized Employee:** Affix a personal lockout or tagout device to the group lockout device, group lockbox, or comparable mechanism before he or she begins work, and shall remove those devices when he or she stops working on the machine or equipment being serviced or maintained.
  - WSU personnel and contractors must use separate locks for their respective designated primary authorized employees.
- **Additional Authorized Personnel:** Each authorized personnel participating in the group LO/TO must be informed of their right to verify the effectiveness of the lockout measures.
  - Each authorized employee must be allowed to personally verify that hazardous energy sources have been effectively isolated if they so choose.
  - Authorized personnel, who opt to verify the effectiveness of the isolation measures, must perform this verification after affixing his or her personal lockout device to the group lockout device and before performing servicing/maintenance activities.
  - It is imperative that each authorized personnel understand the hazards of the work and how to control the hazards.
  - Furthermore, it is required that authorized personnel have knowledge regarding the type and magnitude of the energy, the hazards of the energy to be controlled, and the procedure to be used to control the hazardous energy.

SHIFT OR PERSONNEL CHANGES

Management/Supervisors shall develop procedures to document and describe what to do during shift or personnel changes to ensure the continuity of lockout or tagout protection. This includes providing for the orderly transfer of lockout or tagout protection between off-going and oncoming employees. This shall include:

- **Personnel Changes** - The arriving authorized personnel lock and tag must be applied before the departing authorized employee's lock and tag are removed. The departing personnel will inform the arriving personnel of the status of the equipment and work in progress.
- **Group Lockout/Tagout Shift Changes** - The lock and tag of at least one authorized employee on the arriving shift must be applied before the last group member of the departing group removes their lock. The departing group will inform the arriving group of the status of equipment and work in progress.

- The arriving Primary Authorized Personnel shall walk through the affected work area(s) to verify effective isolation prior to beginning work.
    - It is **not** sufficient for the primary authorized personnel to merely review tests in a job briefing and to rely on a locked box.
    - Rather, each applicable energy isolation device must be verified to assure effective energy isolation.
- When work on a deenergized system will not be carried out on the next shift but the system must remain deenergized, the ending shift personnel shall replace their personal LOTO locks or tags with departmental LOTO locks or tags.
    - The department supervisor shall be responsible for approving the removal of departmental LOTO locks and tags.
    - The application of departmental LOTO locks and tags shall be recorded in a log maintained by the department and will include the name and location of the deenergized system; the reason for the system being locked/tagged out; and the control points where locks/tags have been applied.

CONTRACTORS

WSU and the contractor will inform each other of their respective lockout/ tagout procedures. Contractors working within the University facility are required to make available, if appropriate, a written lockout/ tagout/ energy control program and ensure the protection of their employees, WSU employees and equipment.

- Contractors wanting access to equipment or working on systems shall contact FP&M to secure energy systems for safe access.
- FP&M management is responsible for coordinating contractor activities within university facilities. When both parties are working on machinery/equipment, multiple locks shall be used.
- High voltage electrical work shall be conducted by external contractors only.
    - Safe work practices for high voltage electrical work must be outlined in the contractor's LOTO program documents provided to WSU.
    - WSU personnel are prohibited from working on high voltage electrical systems.

ADDITIONAL PROCEDURES FOR SPECIFIC ENERGY SOURCES

ENERGIZED ELECTRICAL EQUIPMENT

- Electrical energized parts to which an employee may be exposed shall be deenergized before the employee works on or near them, unless the supervisor approves and can demonstrate that de-energizing introduces additional or increased hazards; is not feasible due to equipment design or operational limitations; or when employees are conducting troubleshooting by observation procedures.
- 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, two (2) qualified employees must work together.

COMPRESSED GASES OR AIR

- Compressed gas pressure systems are required to be locked out/tagged out if pressures could result in unexpected movement of the equipment or components.
- 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.
- 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.
- All compressed gas lines must be labeled.

HYDRAULIC ENERGY

- Equipment using hydraulic pressure shall be locked out by placing the hydraulic pump motor electrical disconnect switch to "off" position and applying a lockout/tagout device to the electrical disconnect. Bleed off residual pressure in the system.

GRAVITY AND STORED ENERGY

- 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, residual pressure in steam, air, gas, electrical, mechanical, and/or hydraulic systems.

INSPECTIONS

ROUTINE INSPECTIONS

- The supervising department shall continually monitor employee performance with regard to compliance with this program and shall correct any deviations or inadequacies observed.
- The supervisor must verify the procedure is adequate to provide the necessary protection, and, if inadequate, identify necessary modifications to the written LOTO procedure and notify OEHS.

PERIODIC INSPECTIONS

OEHS, with the authorized department representative shall conduct documented annual inspections of the activities of WSU personnel and/or contractors to ensure:

- The lockout/tagout procedure steps are being followed,
- Personnel involved know their responsibilities under the procedure, and
- The procedure is adequate to provide the necessary protection, and, if inadequate, what modifications are necessary.

The periodic inspections shall be documented using *Appendix C: Lockout/Tagout Periodic Inspection* form. Any deviations or violations found during inspections shall be corrected immediately and documentation of this action maintained. This periodic inspection shall include:

- The inspector, who is designated by the department or unit, is an authorized employee, and must be someone other than the one(s) utilizing the lockout/tagout procedure being inspected, must:
    - Review the written energy control procedure.
    - Observe authorized employee(s) implement the lockout/tagout procedure for the servicing and/or maintenance activities being evaluated,
    - Update any procedural steps that require edits, additions, or removal (**note: all procedural changes must be approved by department or unit supervisors and OEHS**),
    - Communicate and discuss the lockout/tagout procedure and any changes with all other authorized personnel (and affected personnel, where applicable) who did not implement the procedure during the inspection, to ensure authorized personnel (and affected personnel, if applicable) understand their responsibilities under the lockout/tagout procedure being inspected, and the elements set forth in the LOTO Program.
        - This may be accomplished by hosting one or more meetings in which all authorized personnel (and affected personnel, if applicable), will be in attendance to review the specific lockout/tagout procedure.
- Department supervisors must review the completed periodic inspection form and ensure any required updates to the Equipment Specific LOTO Procedure are provided to OEHS to be approved and finalized in the written procedure.
- Completed annual periodic inspection forms must be kept on file by each department or unit and submitted to OEHS to demonstrate compliance with the required annual inspections.
    - Lockout/tagout procedures used less frequently than once a year need to be inspected only when used.

PROGRAM MANAGEMENT

RECORDKEEPING

- Records shall be maintained indefinitely.
- Records shall be maintained by individual departments that perform service or maintenance within the scope of this program and by OEHS.
- Records must be kept in a location that is secure and accessible to individuals who manage the records for the department.
- Records must be provided to OEHS and must be made available to internal auditors and external agencies upon request.
- Records that must be kept include:

Record to Maintain	Department
Classroom or online training for authorized personnel.	OEHS
On-the-job training for authorized personnel (*Appendix E: Employee On-the-Job Training Checklist*)	Individual department, and copy to OEHS
Completed written Equipment Specific LOTO Procedure.	OEHS
Completed Authorized Abandoned/Emergency Lock Removal Form (Appendix D)	Individual department responsible for equipment and OEHS
Completed LOTO Periodic Inspection Forms (Appendix C)	Individual department responsible for equipment and OEHS

PROGRAM REVIEW

- The Control of Hazardous Energy – Lockout/Tagout Program will be periodically reviewed and updated by the WSU Office of Environmental Health and Safety and upon changes to WSU policies and/or external regulatory changes that impact its content.

TRAINING

All WSU affected employees are required to complete LOTO awareness training prior to beginning their job duties. WSU authorized personnel are required to be trained initially upon assignment of LOTO duties and retraining shall occur at intervals as stated in the Personnel Retraining section below. All personnel impacted by this program must be trained on the location and availability of the WSU LOTO Program.

LOTO Training for Authorized Personnel involves two components: initial classroom training and departmental on-the-job training. Classroom training provides the regulatory requirements and the LOTO Program elements and requirements.

Documentation of authorized personnel training is required, to include classroom training completion certificate and completed and signed Appendix E: Employee On-the-Job Training Checklist and shall contain each employee's name and dates of training.

Authorized employee training shall include:

- Requirements of the WSU LOTO Program and MIOSHA Part 85.
- Recognition of applicable hazardous energy sources, the type and magnitude of the energy available in the workplace, and the methods and means necessary for energy isolation and control for maintenance and service.
- Types of energy isolating devices, locks, tags and other applicable LOTO equipment.
- Purpose and use of the LOTO procedure and related steps of the process.
- Tagout systems and their limitations
- How to use, develop, and complete:
    - Appendix A Written Procedure Exception Form
    - Appendix B Lockout/Tagout Draft Procedure Form
- Procedures for restoring service after work has been completed.
- Special procedures and emergency situations

Affected employees and other impacted personnel who will or may potentially be exposed to hazards associated with LOTO activities shall be instructed in the purpose and use of the LOTO procedure and be informed of the following:

- Requirements of the WSU LOTO Program and MIOSHA Part 85 as it relates to affected employees and other impacted personnel.
- The purpose of energy control procedures.
- Prohibition against attempting to restart or reenergize machines or equipment which are locked out and/or tagged out.

DEPARTMENTAL ON-THE-JOB TRAINING

Associate Directors/Supervisors/Principal Investigators shall provide on-the-job training to authorized personnel responsible for performing service and/or maintenance to ensure understanding of the LOTO Program.

Management shall ensure that the purpose and function of the energy control program are understood by personnel and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by personnel.

On-the-job training shall be completed prior to conducting LOTO procedures. On-the-job training will be documented using Appendix E and will be maintained in accordance with the Recordkeeping section of this document.

Departmental on-the-job training for authorized personnel shall include the following:

- Authorized personnel performing service or maintenance within the scope of this program shall be instructed on the purpose and function of the WSU LOTO Program.
- Authorized personnel shall receive training in the recognition of applicable hazardous energy sources, the type and magnitude of the energy, equipment designated for energy isolation, methods and means of controlling energy sources, and verification of LOTO procedures.
- Authorized personnel shall utilize and understand how to complete a LOTO procedure forms (Appendices A and B).

PERSONNEL RETRAINING

Personnel retraining shall be provided for any of the following circumstances:

- Retraining shall be provided for all authorized and affected personnel whenever there is a change in their job assignments, a change in machines, equipment or processes that present a new hazard, or when there is a change in the LOTO procedures.
- Additional retraining shall also be conducted whenever a periodic inspection reveals, or whenever the employer has reason to believe, that there are deviations from or inadequacies in the personnel's knowledge or use of the LOTO procedures.
- Retraining shall reestablish personnel proficiency and introduce new or revised control methods and procedures, as necessary.
- Authorized personnel must be retrained if there are changes to MIOSHA Part 85 or the WSU LOTO Program.

VERSION CONTROL

Version	Date	Notes
1.0	Various	Uncontrolled Versions
2.0	April 2025	Full update and revision. Implement document control process.

APPENDIX A: LOCKOUT/TAGOUT WRITTEN PROCEDURE EXCEPTION FORM

Used to determine if a piece of equipment meets the exception requirements indicating that a written procedure is not needed. ***A copy of this completed form must be provided to OEHS.***

Equipment Name:		**Date:**	
Department:		**Locations**	

WSU need not document the required LOTO procedure for a specific piece of equipment or process, when **ALL** of the following elements exist:

(X) All boxes must be checked in order to utilize the exception!

	The equipment or process has no potential for stored or residual energy or re-accumulation of stored energy after shutting down which could endanger employees.
	The equipment or process has a single energy source which can be readily identified and Isolated.
	The isolation and locking out of that energy source will completely de-energize and deactivate the equipment or process.
	The equipment or process is isolated from that energy source and locked out during servicing and maintenance.
	A single lockout device will achieve a locked-out condition.
	The lockout device is under the exclusive control of the authorized employee performing servicing or maintenance.
	The servicing or maintenance does not create hazards for other employees.
	WSU, in utilizing this exception, has had no accidents involving the unexpected activation or re-energization of this equipment or process during servicing or maintenance.

I, along with the authorized employee, have confirmed that the equipment listed above meets the exception to document a LOTO procedure for the equipment listed above.

SUPERVISOR NAME (printed) *SIGNATURE* *DATE*

AUTHORIZED EMPLOYEE NAME (printed) *SIGNATURE* *DATE*

OEHS REPRESENTATIVE NAME (printed) *SIGNATURE* *DATE*

APPENDIX B: LOCKOUT/TAGOUT DRAFT PROCEDURE FORM

Used to individually identify each energy source, its lockout/tagout point, how to release residual/stored energy, and zero energy verification.

The matrix below is for guidance in identifying each energy source and procedures necessary to lock/tag it out. Complete the step-by-step procedure in the table on the next page.

Hazardous energy		Location of Energy Isolating Device	Procedures for Application of Energy Control			Method to Verify Zero Energy State
Type	**Magnitude**		**Shutdown (Equipment)**	**Isolate (Energy)**	**Release (Stored Energy)**	
☐ Electrical ☐ Pneumatic ☐ Chemical ☐ Mechanical ☐ UV ☐ Electromagnetic ☐ Thermal ☐ Pressure ☐ Vacuum ☐ Radiation ☐ Raised Load ☐ Coiled Spring ☐ Other	_____ Volts _____ Amps _____ Joules _____ lb. Force _____ ft-lb _____ horsepower _____ psi _____ °F _____ °C ☐ Other	☐ On Top ☐ On Bottom ☐ Front ☐ Behind ☐ Left (when facing front) ☐ Right (when facing front) ☐ Other	☐ Stop Button ☐ Operation Switch ☐ Close Valve ☐ Circuit Breaker ☐ Plug Control ☐ Other:	☐ Switches ☐ Breakers ☐ Single Valve ☐ Double Valve ☐ Fuse Blocks ☐ Shielding ☐ Flange Plate ☐ Anti-motion Pin ☐ Blocking ☐ Other	☐ Disconnect ☐ Bleed-off ☐ Restrain ☐ Other	☐ Start Button ☐ Operation Switch ☐ Open Valve ☐ Other
Notes:						

Equipment Name/ Model #:	**Asset or Serial #:**
Building:	**Room/Location**:
Activity/ Process:	**Completed By**:

STEP #	ENERGY TYPE & MAGNITUDE	LOTO DEVICE(S) (Isolation type)	CONTROL METHOD	LOCATION(S) OF CONTROL POINT	VERIFICATION METHOD

Procedure Verified by: **(Additional pages may be needed)**

_____

Signature **Printed Name** **Title** **Date**

APPENDIX C: LOCKOUT / TAGOUT PERIODIC INSPECTION FORM

Building/Room/Location:	**Date:**
Equipment/System:	**Inspector (Authorized Employee):**

List Authorized Employee(s) Conducting LOTO and Their Trade Group	**List Affected Personnel**

Type of Energy Being Isolated (Check All That Apply):

☐ Electrical	☐ Chemical	☐ Hydraulic	☐ Pneumatic	☐ Mechanical
☐ Steam	☐ Gas	☐ Other:		

#	Inspection Review Question	Yes	No
1	Has authorized employee(s) received training and shown satisfactory knowledge of procedure requirements?		
2	Have authorized employee(s) been issued locks, tags, and hasps?		
3	Has the system/equipment had a formal hazard assessment to identify all sources of energies present?		
4	If system/equipment energy(s) cannot be controlled by a single source, are specific procedures written and posted/available?		
5	Does the authorized employee understand how/where to access the lockout/tagout procedure?		
6	Were all affected employees notified of the work to be performed? Specify method of communication.		
7	*For Tagout Only Operation*: If affected employees were present during this Periodic Inspection, did they understand their responsibilities?		

#	Inspection Review Question	Yes	No
8	Did each authorized employee know which energy source(s) to isolate?		
9	Did each authorized employee affix his or her personal lock and tag to the energy isolating device(s)?		
10	Did the authorized employee properly dissipate or control the hazardous energy?		
11	Did each authorized employee test the energy isolating device (i.e., disconnect) to be sure it cannot be moved to the "ON" position?		
12	Prior to starting work on the machine or equipment that was locked out, did each authorized employee verify that the machine or equipment was de-energized?		
13	Was the energy isolating device returned to the "OFF" or “Neutral” position following the verification and prior to performing servicing and maintenance?		
14	Were all steps in the procedure effective to safely shutdown and lockout/tagout hazardous energy to the equipment or system?		
15	Was the startup procedure effective and completed properly at the completion of servicing and maintenance?		
16	Did each authorized employee understand his or her responsibilities under the LOTO procedure being inspected?		

Inspector's overall assessment:

Action Items/Other Observations:

Inspector’s Name (printed) *Inspector’s Signature* *Date*

The original must be maintained by the department completing this form.
A copy must be provided to OEHS.

APPENDIX D: ABANDONED / EMERGENCY LOCK REMOVAL FORM

Completed forms must be maintained with departmental records.

Note: Only FP&M Associate Directors may authorize emergency removal of locks. OEHS must be notified, and a copy of this completed form must be sent to OEHS.

Lock Owner Name:	**Date:**
Machine/System Name:	**Location:**
Attempted to contact employee by: ☐ Email ☐ Phone ☐ Other:	**Communication Date(s) and Time(s):**
Communication with:	**Dean/Director/Manager/Supervisor Notified?** ☐ Yes ☐ No Initials:
Repair Completed? ☐ Yes ☐ No Initials:	**Equipment cleared of tools/materials?** ☐ Yes ☐ No Initials:
Guards replaced and functioning correctly? ☐ Yes ☐ No Initials:	**Affected employees notified that equipment ready for restart?** ☐ Yes ☐ No Initials:
Supervisor / Lead must contact the authorized employee whose lock was removed and brief him/her on the status of the service or maintenance project upon the employee's return to work. ☐ Yes ☐ No Initials:	

Department or Unit Supervisor Completing This Form:

Name (printed) *Signature* *Date*

FP&M Associate Director Authorizing Lock Removal:

Name (printed) *Signature* *Date*

APPENDIX E: EMPLOYEE ON-THE-JOB TRAINING CHECKLIST

All authorized employees must receive on-the-job training on the specific knowledge and steps required to safely and effectively follow a lockout/tagout procedure. The supervisor of the employee or an OEHS representative must complete the checklist below during on-the-job training. This is required before locks/tags can be issued. Marking an item as complete certifies that the employee can explain the step in its entirety and perform it independently.

Employee:	**Date**:
Equipment Name:	**Equipment Location**:
Building & Campus Location:	**Supervisor**:

Lockout/Tagout Workplace Knowledge:

Knowledge	Complete
Employee shown the location of the WSU Control of Hazardous Energy: Lockout/Tagout program document and acknowledges that they have read it.	
Employee has been informed of the types and magnitude of energies in their immediate workplace, that they may encounter as part of their Lockout/Tagout duties.	

Step 1: Notification

Task	Complete
Employee can identify Affected or Other employees that must be notified when piece of equipment is being serviced.	
Employee can describe the method used to inform these individuals.	

Step 2-6: Individually Identify Each Energy Source and Applicable Shutdown, Isolation, Residual Energy Release, Lockout, and Verification Procedures

Task	Complete
Step 2: Employee can identify all energy sources associated with equipment, the magnitude of each energy source, and explain the hazards associated with each source.	
Step 3: Employee can explain and perform the method to shut down each energy source, including the location of shutdown mechanisms.	
Step 4: Employee can explain and perform the method to isolate energy sources, including the equipment used and how to release residual energy(ies).	
Step 5: Employee can explain and perform the method to lockout energy sources.	
Step 6: Employee can explain and perform the method to verify the lockout of each energy source.	

Step 7: Neutralize

Task	Complete
Employee can explain and perform the method of returning all controls to neutral following the verification of all energy sources.	

Step 8: Perform Service and/or Maintenance
Utilize departmental task specific procedures and/or Standard Operating Procedures.

Step 9: Release From Lockout/Tagout

Task	Complete
Employee can explain and perform the method to release equipment from lockout/tagout.	

Comments

Employee:
I certify that I am able to describe and perform all of the tasks listed above in their entirety.

Name (printed) *Signature* *Date*

Supervisor:
I certify that the employee is able to describe and perform all tasks listed above in their entirety.

Name (printed) *Signature* *Date*

The department must maintain this completed form for the length of the employee's employment plus 3 years.

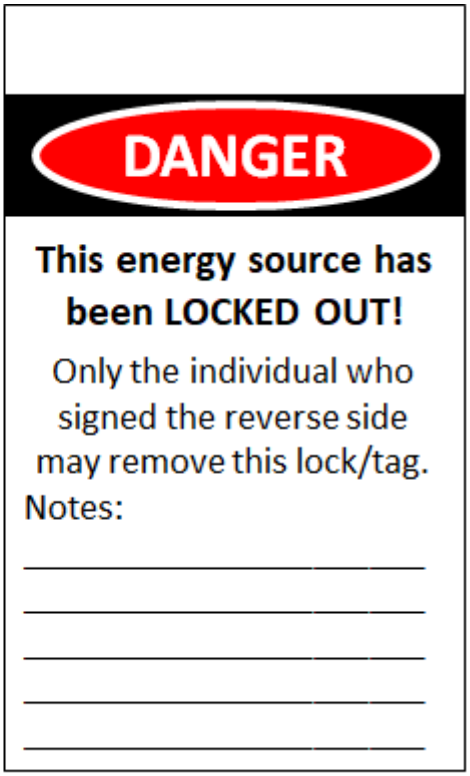
A completed copy must also be submitted to OEHS.

APPENDIX F: EXAMPLES OF LOCK LABEL AND TAGOUT DEVICE

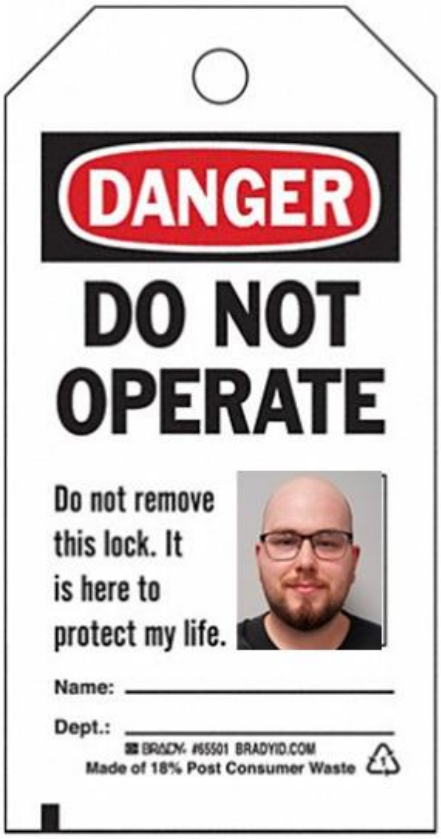
AUTHORIZED **Maintenance** *Employee Name* *Lock number*	**LOCKED OUT FOR SAFETY**	*Pic* **DANGER**	**DO NOT REMOVE** My Life Depends on it!

AUTHORIZED **Maintenance** **Kyle Williamson** ***13F658***	**LOCKED OUT FOR SAFETY**	 **DANGER**	**DO NOT REMOVE** My Life Depends on it!

FRONT



BACK



APPENDIX G: ENERGIZED ELECTRICAL WORK PERMIT (EEWP) FORM

Under NFPA 70E, there are only two instances in which an employee can work on live parts.

1. When de-energizing would interrupt essential life support, emergency alarms or ventilation systems.
2. When the organization can demonstrate that de-energizing the system would introduce additional or increased hazards or that it is infeasible due to equipment design or operational limitations.

The justification for performing energized work must be safety-based. Convenience may not be used as the sole justification for energized work.

In these situations, an approved energized electrical work permit (EEWP) is required for all manipulative energized work on hazardous electrical equipment. *Manipulative energized work* includes assembly, disassembly, tightening, adjusting or rearrangement of components while they are energized.

INSTRUCTIONS

- Complete sections 1 and 2 with verifications and attach supporting documents before seeking approving authority signatures:
  - Section 1 must be complete before Section 2 and 3 approval signatures are obtained.
  - The approved EEWP and electrical work plan (EWP) or job safety analysis (JSA) must be at the jobsite while performing work.
  - A closeout signature in Section 4 is required within seven days after completion of the work.
  - Upon completion of work provide a copy of the EEWP (with Section 4 complete) and the electrical work plan (EWP) or job safety analysis (JSA) to OEHS.
- Approvals are granted only for the specific work planned, period, location, personnel, and conditions described. Any changes to the planned work once energized electrical work proceeds will immediately void any authority to continue work. It is essential that the energized electrical work be completely understood in advance and be thoroughly planned, with strict compliance to the authorized procedures and process.
- Approvals required:
  - FP&M Director
  - OEHS Director

NOTE: Work on energized non-hazardous equipment as well as testing, troubleshooting, and voltage measuring on energized hazardous equipment, is exempt from the required EEWP per NFPA 70E, Article 130, provided that safe work practices and personal protective equipment are used.

Hazard thresholds for electrical equipment:

1. Equipment with voltage ≥ 50 V and short circuit output current ≥ 5 mA.
2. Equipment with voltage < 50 V and output power ≥ 1000 W.
3. Equipment with stored electrical energy capacity > 10 J.

Electrical equipment that does not meet any of the above thresholds is deemed non-hazardous and is exempt from Energized Electrical Work Permit requirements.

SECTION 1: REQUEST FOR ENERGIZED ELECTRICAL WORK ACROSS APPROACH BOUNDARIES

(Complete in full)

Requester's name *(print)*:	Phone:	Date:
Describe the electrical equipment and scope of energized electrical work: *(be specific)*:		
Compelling need to support a request to do work on energized electrical equipment *(the justification must be safety-based; that is, explain why it is safer to perform the task energized than de-energized)*:		
Alternatives to avoid doing work on energized electrical equipment:		

DEPARTMENT REQUEST – REVIEW AND APPROVAL

Approving authority: ☐ Supervisor ☐ Department Head ☐ System Owner ☐ Principal Investigator	
Name *(print)*:	
Approval / Disapproval: ☐ Yes, proceed ☐ No, do not proceed	
Signature:	Date:

SECTION 2: ENERGIZED ELECTRICAL WORK APPROACH BOUNDARIES AND SUPPORTING INFORMATION

(Complete in full)

Circuit location building:	**Panel or equipment / circuit:**	
Energized components exposed to workers:		
Nominal circuit potential (volts):	**Frequency (hertz):**	**Short circuit current (amperes):**
Boundary access intrusion limit (in inches) for flash:	**Limited:**	**Restricted:**
Arc flash protection boundary is from arc flash analysis (calculated)? ☐ Yes ☐ No (*If no arc flash analysis exists, then one must be performed.)*		
Describe safe work procedures, hazard analysis, access control, and mitigating PPE in detail in an attached electrical work plan (EWP) or non-routine job safety analysis (JSA).		
Brief work description:		
Start work date:	**End work date:**	
Expected duration of actual boundary intrusion (hours):	**Number of workers crossing boundary:**	

Department / group performing or directing energized work:	**Phone:**
Subcontractor performing energized work (if any):	**Phone:**
First qualified electrical worker (in charge):	**Phone:**
Second qualified electrical worker (backup):	**Phone:**
Safety-watch qualified worker:	**Phone:**

Names of other workers:		
For the following three confirming verifications, a project lead or supervisor normally signs. Verification may NOT be signed by the qualified workers listed above or by any person named in request Section 1.		
A non-routine job safety analysis (JSA) or electrical work plan (EWP) is attached? ☐ Yes ☐ No		
The JSA / EWP has been reviewed in detail and discussed by the affected qualified workers and is adequate for the energized electrical work described? ☐ Yes ☐ No		
Verified by *(print)*:	**Signature:**	**Date:**
Current training reports for the qualified electrical workers listed are attached? ☐ Yes ☐ No		
Qualified electrical worker training is current/adequate for the energized electrical work described? ☐ Yes ☐ No		
Verified by *(print)*:	**Signature:**	**Date:**
Current personal protective equipment (PPE) electrical test reports are attached? ☐ Yes ☐ No		
All required PPE listed on the JSA / EWP, is certified by test to be safe, is usable during the period of the work, is in the possession of the listed workers qualified to use it and is adequate for the energized electrical work described? ☐ Yes ☐ No		
Verified by *(print)*:	**Signature:**	**Date:**

SECTION 3: APPROVALS

DEPARTMENT CHAIR *(required for research equipment EEWPs)*

Approving authority (DEPARTMENT CHAIR)		
Name *(print)*:		
Approval / disapproval: ☐ Yes, proceed ☐ No, do not proceed		
Signature:	Date:	Time:

FP&M DIRECTOR *(required for all non-research equipment EEWPs)*

Approving authority (FP&M DIRECTOR)		
Name *(print)*:		
Approval / disapproval: ☐ Yes, proceed ☐ No, do not proceed		
Signature:	Date:	Time:

WSU FIRE MARSHAL *(required for all EEWPs)*

Approving authority (WSU FIRE MARSHAL)		
Name *(print)*:		
Approval / disapproval: ☐ Yes, proceed ☐ No, do not proceed		
Signature:	Date:	Time:

OEHS DIRECTOR *(required for all EEWPs)*

Approving authority (OEHS DIRECTOR)		
Name *(print)*:		
Approval / disapproval: ☐ Yes, proceed ☐ No, do not proceed		
Signature:	Date:	Time:

APPENDIX H: ELECTRICAL WORK PLAN (EWP) FORM

All work on energized electrical equipment not meeting the definition of non-hazardous electrical equipment must have had a hazard analysis completed and a completed Electrical Work Plan or Job Safety Analysis attached to an Energized Electrical Work Permit. The completed Energized Electrical Work Permit must be approved by appropriate authorities prior to energized electrical work is conducted.

Job / activity:	**Start date:**	**Valid through: (1 year max)**
Prepared by (print):	**Signature:**	**Date:**
Person in charge (print):	**Signature:**	**Date:**
Other reviewer (print):	**Signature:**	**Date:**
Scope of work summary:		

1. Hazard Analysis (add rows as needed)

Step or Task	**Step or Task Description**	**Hazard** (include shock and arc flash hazard information from the hazard label affixed to the equipment or from the electrical analysis engineer)	**Control** (include electrical safety PPE based on the electrical hazard information)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

2. Authorization

Authorizer (administrative or functional supervisor). I have reviewed the steps, hazards and controls described in this EWP. Workers are qualified (that is, licensed or certified, as appropriate, and in full compliance with SLAC training requirements) to perform this activity.		
Name (print):	**Signature:**	**Date:**

3. Worker Acknowledgement (add rows as needed)

Worker. I understand and will adhere to the steps, hazards, and controls in this EWP. I understand that performing steps out of sequence may pose hazards that have not been evaluated nor authorized. I will contact the person who authorized my work before continuing if the scope of work changes or new hazards are introduced. I understand my stop work authority and responsibility.

Name (print)	Signature	Date