RUTGERS
Institutional Planning and Operations

Rutgers Environmental Health and Safety (REHS)

Program Name:	Lockout/Tagout Program (Control of Hazardous Energy)		
Responsible Executive:	Executive Director of REHS		
Adopted:	January 1, 1997	**Reviewed/Revised:**	July 6, 2018

1. **Program Statement**
   It is the policy of Rutgers University to provide a safe and healthful workplace, including minimizing risks associated with the unexpected energization, start up or release of store energy.

2. **Reason for Program**
   This program establishes procedures to ensure safety during servicing or maintenance of machines, equipment or processes where the unexpected energization, start up or release of stored energy could cause injury to employees. It is also designed to ensure compliance with the following OSHA/PEOSH standards:

   - *The Control of Hazardous Energy (Lockout/Tagout)* - 29 CFR 1910.147 (General Industry Standard)

3. **Who Should Read this Program**
   This program applies to all Rutgers employees who may service or perform maintenance work on machines, equipment or processes while performing their assigned duties.

   This program does NOT cover the following:

   - Construction, agriculture and maritime employment
   - Installations under the exclusive control of electric utilities for the purpose of power generation, transmission and distribution, including related equipment for communication and metering (covered by 29 CFR 1910.269)
   - Exposure to electrical hazards from work on, near, or with conductors or equipment in electric utilization installations (covered by 29 CFR 1910 Subpart S)
   - Oil and gas well drilling and servicing.
   - Work on plug or cord type electrical equipment provided that the following is adhered to:

     1) The equipment is unplugged from the energy source, and

2) The plug is under the exclusive control of the employee performing the work by being in the possession of the employee, in arm's reach and in the line of sight of the employee, or the employee has affixed a lockout/tagout device on the plug.

3) Lockout/tagout procedures must be used if the above requirements cannot be or are not met.

- Normal production operations provided that the employee(s) are protected by existing machine guarding (29 CFR 1910 Subpart O)

  1) If a guard is removed or bypassed or the employee(s) is required to place any part of his/her body into an area of the machine, equipment or process where work is actually performed or an associated danger zone exists during a machine operating cycle, lockout/tagout procedures must be utilized.

- Servicing or maintenance which takes place during normal production operations, such as lubricating, cleaning, servicing of filters and making minor adjustments and simple tool changes provided that they are routine, repetitive and integral to the use of the machine or equipment and the employee(s) are protected by other effective measures (such as machine guarding).

  1) Replacement of valves, gauges, linkages, support structures, etc. are not considered servicing or maintenance work during normal productions operations. Lockout/tagout procedures must be followed when performing such work.

4. **The Program**

I. **Roles and Responsibilities**

A. Rutgers Environmental Health and Safety (REHS)

REHS provides program oversight and consultation to Rutgers departments regarding the control of hazardous energy and will:

2) Provide technical support and training.

3) Assist in the investigation of accidents or near miss events involving lockout/tagout.

4) Conduct periodic audits of the program.

5) Review modified group lockout/tagout procedures.

B. Institutional Planning & Operations (IP&O), Dining Services, Housing, Utilities, Contract Services, Laboratories and All Other Departments with Energized Equipment/Processes

Each Department responsible for maintaining and servicing equipment and processes with the potential for unexpected release of hazardous energy must:

1) Develop specific lockout/tagout procedures for the servicing and maintenance of machines, equipment or processes in their area.

2) List all machines, equipment and processes that will require implementation of lockout/tagout procedures (See Appendix A).

3) Identify (in writing) all authorized employees who will be required to utilize lockout/tagout procedures to perform assigned duties.

4) Supply required equipment such as locks, tags, chains, lockout devices, personal protective equipment (PPE) when lockout/tagout procedures are required.

5) Maintain records including periodic inspection documentation, specific lockout/tagout procedures and training records.

6) Ensure requirements of the Lockout/Tagout Program are followed. Enforce compliance and treat violations in accordance with the progressive discipline agreement with the unions.

7) Make the Lockout/Tagout Program accessible for employee review.

8) Ensure that machines, equipment or processes that are newly installed or major repair, renovation or modifications to the existing machines, equipment or processes are designed to accept a lockout device.

C. Supervisors

Supervisors of employees who work on energized machines, equipment or processes must:

1) Ensure that all Department Responsibilities (See Section 4 (I) (B)) are implemented.

2) Ensure that required equipment is available and used.

3) Qualify as an authorized employee.

4) Conduct periodic inspections to ensure that lockout/tagout procedures are being properly implemented.

5) Investigate accidents and near miss events in which an employee was utilizing or failed to utilize lockout/tagout procedures.

D. Employees

Employees who work on energized machines, equipment or processes must:

1) Attend and actively participate in training sessions.

2) Demonstrate comprehension and understanding of the Lockout/Tagout Program as it applies to their work.

3) Read and understand lockout/tagout procedures prior to performing work. Follow lockout/tagout procedures during the servicing and maintenance of energized machines, equipment or processes.

4) Immediately report accidents, near miss events or any other unsafe condition to their supervisor.

II. Definitions

Affected Employee	An employee, other than the authorized employee, whose job requires him/her to operate or use a machine, equipment or process on which servicing or maintenance work is being performed under lockout/tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.
Authorized Employee	An employee who has the authority, responsibility, training and knowledge to perform a specific lockout and/or tagout assignment.
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.
Employee	Any person drawing a university paycheck.
Employer	Rutgers University.
Energized	Connected to an energy source (mechanical, electrical, hydraulic, etc.) which has not been isolated 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: electrical circuit breakers, disconnect switches, manually operated switches, slide gates, line valves, blocks, etc. NOTE: Push buttons, selector switches and other control circuit type devices are not energy isolating devices.
Energy Source	Any electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other energy source that is capable of causing injury to employees.
Hot Tap	A procedure used in the repair, maintenance and service activities which involves welding a piece of equipment (pipelines, vessels or tanks) under pressure in order to install connections or appurtenances.
Lockout/Tagout	The placement of a lockout device and a tagout device on the energy isolating device in accordance with an established procedure, ensuring that the energy isolating device or the equipment being controlled shall not be operated until the removal of the lock or tag.
Lockout Device	A device that utilizes a positive means such as a lock to hold an energy isolating device in a safe position and prevent the energization of the machine, equipment or process.

Normal Production Operations	Operations that include those activities which enable the machines or equipment to perform its intended production functions, and which are carried out by employees as part of the production process with the machines, equipment or processes energized.
Servicing or Maintenance	Functions that include workplace activities such as installing, construction, adjusting, setting up, inspecting and maintaining or repairing machines, equipment or processes. These activities include lubrication, cleaning or unjamming of machines or equipment and making adjustments or tool changes, where the employee(s) may be exposed to the unexpected energization or startup of the machine, equipment or process or release of hazardous energy.
Setting Up	Any work that must be performed to place a machine or equipment in an operational mode.
Tagout	The placement of a tagout device on an energy isolating device, in accordance with established procedures, to indicate that the energy isolating device and the machine, equipment or process being controlled may not be operated until the tagout device is removed.
Tagout Device	A prominent warning device, such as a tag and a means of attachment, capable of being securely attached to an energy isolating device, in accordance with established procedures, that identifies the applier or authority who has control of the energy control procedure, contains information and/or instructions to prevent the operation of an energy isolating device and indicates that the energy isolating device and the machine, equipment or process being controlled may not be operated until the tagout device is removed.

III. Procedures

A. General Lockout/Tagout Procedures

The following minimal procedures must be followed for all servicing or maintenance of machines, equipment or processes in which the unexpected energization, start up or release of stored energy could cause injury to an employee:

1) The supervisor shall designate an authorized employee(s) to have the authority and responsibility to perform a specific lockout/tagout assignment.

2) The authorized employee(s) will read and understand all lockout/tagout procedures prior to performing any work. Specific procedures must be developed for all individual or same types of machines, equipment or processes (See exception in Section B: Special Procedures).

3) The supervisor and authorized employee(s) 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 and determine how to safely release all stored energy prior to performing any work, including turning off the machine, equipment or process.

   NOTE: All back up energy sources, such as emergency generators, must be identified as energy sources.

4) The authorized employee or his/her supervisor will instruct all affected employees and any other employee(s) or department impacted by the lockout/tagout procedures about the purpose, the use and the effects to their work operations when lockout/tagout procedures are utilized prior to any work being performed.

5) The machine, equipment or process shall be turned off by the authorized employee.

6) The machine, equipment or process shall be isolated from the energy source(s) by appropriate isolating devices, such as by closing valves, turning off circuits, etc.

   NOTE: Back up energy sources must also be isolated if they do not share the same valve, circuit, etc.

7) A lockout device shall be affixed to the energy source that will hold the isolating device in a safe or neutral position. If a lockout device(s) cannot be directly affixed to the energy isolating device, an attachment shall be made so that a lockout device(s) can be applied. Each employee or group working on the machine, equipment or process will apply his/her individual lockout device. If the machine, equipment or process cannot be locked out, please refer to Section B: Special Procedures - Procedures for Tagout Only.

8) The authorized employee(s) shall mark or label the energy isolating device to identify the machine, equipment or process supplied and the type and magnitude of the energy being controlled, unless they are so positioned or arranged that those elements are evident.

9) A tagout device shall be affixed to the locking device, energy source, or as close as possible to the device if it cannot be affixed directly. The tagout device must be affixed in such a manner as will clearly indicate that the operation or movement of the energy isolating device from the "SAFE", "OFF" or "CLOSED" position is prohibited.

10) After the lockout/tagout devices have been applied, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained, or otherwise rendered safe by bleeding, draining, discharging, disconnecting, etc. The authorized employee(s) shall ensure that all employees are clear of the area surrounding the machine, equipment or process prior to releasing the stored energy.

    NOTE: The authorized employee(s) or supervisor shall know what to expect when the stored or residual energy is released and the effect(s) of releasing the stored energy will have on the machine, equipment or process prior to releasing the stored energy. The machine or equipment will be properly positioned prior to releasing the stored energy.

11) The authorized employee(s) shall verify that the machine or equipment is isolated by attempting to operate the machine or equipment by checking switches, valves, etc. The authorized employee(s) shall ensure the area surrounding the machine, equipment or process is clear of all employees prior to verification.

NOTE: The operating controls, valves, etc. must be returned to a "NEUTRAL", "OFF" or "CLOSED" position after the test.

12) Servicing and maintenance work on the machine or equipment may be performed.

13) If there is a possibility of re-accumulation of stored energy, verification of isolation by checking the on/off switch or other equivalent means shall continue until the activity is completed, or until the possibility of such accumulation no longer exists.

    NOTE: The authorized employee(s) shall ensure that all employees are clear of the work area prior to verification.

14) If the energy isolating device(s) is locked and tagged, and there is a need to test the position of the machine or equipment, the following sequence must be followed:

    a. Ensure that all components are operationally intact.
    b. Ensure that all employees are safely positioned.
    c. Clear the machine or equipment of all tools and materials.
    d. Remove the lockout device. Each individual or group will remove his/her own lockout device.
    e. Energize and proceed with testing or positioning.
    f. Repeat steps 6 – 13.

15) If using a group lockout/tagout procedure and the primary authorized employee must leave the work area, another authorized employee shall be given the authority and responsibility for the work assignment. The procedures for personnel changes shall be followed (See Section B – Group Lockout/Tagout). If another authorized employee is unavailable, all work shall cease and all affected or impacted employee(s) and department(s) shall be notified. Steps 5 - 13 shall be repeated upon returning to the work area.

16) When the work is completed, the authorized employee(s) shall ensure the following procedures are followed:

    a. Ensure that all components are operationally intact.
    b. Clear the machine or equipment of all tools and materials.
    c. Replace all machine or equipment guards.
    d. Ensure that all employees are safely positioned.
    e. Remove the lockout and tagout device(s). Each individual or group will remove his/her own lockout and tagout device. REMINDER: Do not leave the tagout device.
    f. Inform all affected employees, impacted employee(s) and departments that work has been completed.
    g. Energize the machine, equipment or process.

17) Any time the authorized employee(s) leaves the work area or the servicing or maintenance work will require more than 1 shift to complete, the authorized employee(s) must repeat the lockout/tagout procedures each time he/she arrives on site to perform additional work.

18) The supervisor or authorized employee may include additional procedures to perform a specific lockout/tagout assignment.

B. Special Procedures

<u>Removal of a Lockout Device by Another Person</u>

The removal of a lockout device by another employee is permitted only if all of the following are met:

1) The supervisor verifies that the authorized employee is not at the facility.

2) The supervisor of the authorized employee who installed the lockout device removes the lockout device.

3) The supervisor becomes the authorized employee for the job assignment or designates another authorized employee to complete the job.

4) An attempt is made to notify the employee.

5) The authorized employee who originally installed the lockout device is notified that the device has been removed before resuming work.

Procedures for Tagout Only

The following tagout procedures must be used when the equipment, machine or process cannot be locked out:

1) The machine, equipment or process must be locked out if possible.

2) The tagout of the energy isolating device(s) must provide equivalent protection as a lockout device would provide.

3) Additional safety procedures must be implemented to reduce the likelihood of inadvertent energization, i.e. removal of an isolating circuit element, blocking of a control switch, removal of a valve handle. The energy isolating device should be within view of the authorized employee(s) or the "buddy" system or another additional safety procedure must be used.

Group Lockout/Tagout

Group lockout/tagout procedures must afford the authorized employees a level of protection equivalent to that provided by the implementation of a personal lockout and/or tagout device. The following additional procedures must be incorporated when a group lockout/tagout procedure is required:

1) An authorized employee shall be given primary responsibility for a set number of employees working under the protection of a particular group lockout/tagout device. The supervisor of the group will designate that authorized employee.

2) The authorized employee responsible for the work shall ascertain the exposure status of all group members with regard to the lockout/tagout of the machine, equipment or process.

3) When more than one crew, craft, or department is involved, the responsibility of the overall lockout/tagout control shall be assigned to an authorized employee designated to coordinate affected work forces and ensure continuity of protection. The department with the overall responsibility for the job will designate this employee.

4) In most cases, each authorized employee shall affix a personal lockout and/or tagout device to the group lockout device, group lockbox, or comparable mechanism when

he/she begins work, and shall remove those devices when he/she completes his/her work.

5) If servicing or maintaining sophisticated and complex machines, equipment or processes, the group lockout/tagout procedures may be modified. The procedures must be developed prior to any work, must provide the same level of protection to the authorized employees as an individual lockout and tagout devices and a system of continuous worker accountability must be established. These procedures must be written, added to the Lockout/Tagout Program and approved by REHS.

Special Procedures for Shift or Personnel Changes

The following additional procedures shall be followed when there is a shift or personnel change:

1) Perform an orderly exchange of locks and tags. Each individual or group will remove his/her lockout and tagout devices. The replacement shift or worker will then place his/her lockout and tagout devices in place of the original devices.

2) The replacement authorized employee(s) will repeat all lockout/tagout procedures.

Information on Specific Energy Control Procedures

As stated in Section B - Department Responsibilities and Section III (A) General Lockout/Tagout Procedures, specific written procedures must be developed for each machine, equipment or process that requires lockout/tagout work to be performed. These procedures must be added to the program.

The specific procedures must clearly and specifically outline the scope, purpose, authorization, rules and techniques to be utilized for the control of hazardous energy, and the means to enforce compliance and must contain the following:

1) A specific statement as to the intended use of the procedure.

2) Specific procedural steps for the shutting down, isolating, blocking and securing machines, equipment or processes to control hazardous energy.

3) Specific procedural steps for the placement, removal and transfer of lockout devices or tagout devices and the responsibilities for them.

4) Specific requirements for testing a machine, equipment or process to determine and verify the effectiveness of lockout devices, tagout devices and other energy control measures.

There are two exceptions for developing individual specific procedures:

1) One energy control procedure may be developed and used for similar machines, equipment or processes if the procedure adequately addresses the unexpected energization hazards related to each machine, equipment or process or the general lockout/tagout procedures are used and supplemental checklists or appendices are developed that adequately address the steps necessary to perform the work safely.

2) A specific written procedure is not required for machines, equipment or processes that meet all of the following:

a. The machine, equipment or process has no potential for stored or residual energy or re-accumulation of stored energy after shut down which could endanger employees.

b. The machine, equipment or process has a single energy source which can be readily identified and isolated.

c. The isolation and locking out of the energy source will completely de-energize and deactivate the machine, equipment or process.

d. The machine, equipment or process is isolated from the energy source and locked out and tagged out during servicing or maintenance by following the general lockout/tagout procedures (See Section III (A) – General Lockout/Tagout Procedures).

e. A single lockout device will achieve a locked-out condition.

f. The lockout device is under the exclusive control of the authorized employee(s) performing the work.

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

h. The department, in utilizing this exception, has had no accidents involving the unexpected activation or re-energization of the machines, equipment or processes during servicing or maintenance work.

C. Periodic Inspections

Supervisors must perform periodic inspections, at least yearly, to ensure that the lockout/tagout procedures are being properly implemented. Periodic inspections must be conducted for each specific lockout/tagout procedure that was developed. Machines, equipment or processes that utilize the same lockout/tagout procedures do not have to be inspected individually. The Department must ensure that periodic inspections for each specific lockout/tagout procedure developed are inspected at least yearly by a representative sample for each procedure. The supervisor shall note any deviations or inadequacies observed during the inspection. The inspections must include the following:

1) Notification of all affected employees or any other employee(s) or department(s) impacted by the work

2) Proper lockout/tagout materials and hardware

3) Proper lockout/tagout procedures

4) Proper personal protective equipment (PPE) and tools

The supervisor must review the employees' responsibilities under the energy control procedure being inspected.

The supervisor shall correct and inform the authorized employee(s) of any deviations or inadequacies that were observed.

Written documentation of the inspections shall be made to certify that the inspections have been performed. The documentation must contain the following: (See appendix B)

1) Identity and location of the machine, equipment or process inspected.

2) Date of the inspection.

3) Name and signature of the supervisor performing the inspection.

4) Name of the authorized employee(s) inspected.

5) Any deviation or inadequacies observed during the inspection.

The supervisor shall arrange for training when the periodic inspections reveal deviations or inadequacies in the lockout/tagout procedures that warrant re-training.

D. Protective Materials and Hardware

The Department must supply all locks, tags, chains, adapter pins, other hardware, personal protective equipment (PPE), or any other tools or equipment required for the securing or blocking of the energy source and the servicing or maintenance of the machines, equipment or processes.

The lockout/tagout devices supplied by the department shall be:

1) Singularly identified.

2) The only authorized devices used for locking out and tagging out energy sources.

3) Not used for any other purpose.

The lockout and tagout devices must meet the following requirements:

1) *Durability* - shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected.

2) *Standardized* - shall be standardized in at least one of the following: shape, size, type or format.

3) *Substantial* - lockout devices shall be of such key complexity that removal by any other means than the required key would require excessive force or unusual techniques. Tags and attachment mechanisms must be of such design that the possibility of accidental removal is minimized. Tagout device attachment means must be non-reusable, attachable by hand, self-locking, non-releasable with a minimum unlocking strength of no less than 50 pounds and be of or similar to a one-piece nylon cable tie. (Note: string, cord or adhesives are not permitted to attach tagout devices).

4) *Identifying* - shall include provisions for the identification of the employee(s) applying the device(s).

Tagout tags must withstand the environment in which it is installed, should not deteriorate, must remain legible, be able to withstand exposure to weather conditions or wet or damp locations and shall contain the following:

1) A warning against hazardous conditions if the machine or equipment is re-energized.

2) A legend stating "DO NOT START", "DO NOT OPEN", "DO NOT CLOSE", "DO NOT ENERGIZE", or other similar language.

3) The authorized employee(s) name and department.

4) The date the tag was applied.

IV. Contractors

Contractors and the hiring Department shall inform each other of their respective Lockout/Tagout Program.

If the contractor does not have a lockout/tagout program and the scope of the work is covered by this standard, the contractor may not perform work at the University.

The Department hiring the contractor shall ensure that all affected employees understand and comply with the restrictions and prohibitions of the contractor's Lockout/Tagout Program.

V. Training Requirements

A. Authorized Employees

All Employees (including supervisors) authorized to perform lockout/tagout procedures shall be trained in the following:

1) Recognition of hazardous energy sources.

2) Control and isolation of energy sources.

3) Type and magnitude of energy available in the workplace.

4) Proper lockout/tagout procedures.

5) Proper ‘tagout only’ applications and limitation of ‘tagout only’ applications.

6) Locations of the written Lockout/Tagout Program and specific lockout/tagout procedures.

Authorized employees must receive training under the following conditions:

1) Initially and prior to performing any work that requires use of lockout/tagout procedures.

2) When there is a change in job assignment.

3) When there is a change in machines, equipment or processes that present a new hazard.

4) When there is a change in the lockout/tagout procedures.

5) When a periodic inspection reveals or a supervisor believes that there are deviations from or inadequacies in the employee's knowledge or use of lockout/tagout procedures.

6) Refresher training.

B. Affected Employees

All affected employees shall be trained in the following:

1) The purpose and use of the lockout/tagout procedures.

2) Their role in the program which shall not include the performance of any servicing or maintenance work that requires implementation of lockout/tagout procedures.

C. Other Employees

All other employees whose work operations are or may be in the area where lockout/tagout procedures may be utilized must be instructed in the following:

1) The purpose and use of the lockout/tagout procedures.

2) They are prohibited from attempting to start or re-energize equipment, machines or processes when they are locked out and/or tagged out.

3) They shall not perform any servicing or maintenance work that requires implementation of lockout/tagout procedures.

D. Training Documentation

The Department or Supervisor must document that all training has been accomplished. The following written documentation of training must be retained:

1) Subject matter.

2) Training date(s).

3) Name and signature of trainer(s).

4) Names and signatures of employees attending training.

A copy of the training records must be sent to REHS. The training documentation must indicate that all employees covered by this program were trained in the purpose and function of the Lockout/Tagout Program and that the employees understood the program and have the knowledge, skill and proficiency required for the safe application, usage and removal of the energy controls.

VI. Appendices

A. Equipment List Form
B. Periodic Inspection Form

APPENDIX A

LIST OF ALL TYPES OF MACHINES OR EQUIPMENT THAT REQUIRE IMPLEMENTATION OF LOCKOUT/TAGOUT PROCEDURES

The following types of machines or equipment require the use of lockout/tagout procedures. Only authorized employees may perform servicing or maintenance work on the machines and equipment listed below:

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2.

3.

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10.

APPENDIX B

LOCKOUT / TAGOUT
PERIODIC INSPECTION REPORT

Name of Inspector: _____ Date: _____

Names of Employees Inspected: _____

_____

_____

Name of Authorized Employee in charge of work (if applicable): _____

_____

Name of the machine(s) or equipment: _____

_____

Location of the machine(s) or equipment: _____

_____

Description of the work: _____

_____

_____

Any noted deviation or inadequacies during the inspection: _____

_____

_____

_____

Any additional comments or observations: _____

_____

_____

Inspector's Signature: _____