UNIVERSITY OF
NEW HAVEN

LOCKOUT/TAGOUT

POLICY AND PROCEDURE

Prepared By:
Triumvirate Environmental

Developed: January 2013

Program Approval

Associate Vice President of Public Safety & Administrative Services — Date 3/12/14

Associate Vice President of Facilities — Date 3/7/13

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1.0 Purpose

The University of New Haven has developed a Lockout/Tagout (LOTO) program that describes specific practices and procedures to safeguard employees from the unexpected energization or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities.

This program applies to both employees of University of New Haven and contractors in all University owned and/or leased buildings and properties. This program is based on requirements of OSHA Standard 29 CFR1910.147 and applies to the control of energy during servicing and or maintenance of machines and equipment. This program addresses procedures for affixing appropriate lockout devices or tagout devices to energy isolating devices, and to disable machines or equipment to prevent unexpected energization, start or release of stored energy in order to prevent injury to employees.

1.1 Scope

University of New Haven's LOTO program establishes the minimum requirements for the lockout and tagout of equipment with hazardous energy sources including electrical, mechanical, pneumatic, hydraulic or gravitational. Procedures outlined in this program will be used to ensure that machines or equipment are isolated from all potentially hazardous energy and locked out and tagged out before employees or contractors perform any servicing or maintenance activities where the unexpected energization, start-up or release of stored energy could cause injury.

This program **does not** apply for the following:

- Work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energization or start up of the equipment is controlled by the unplugging of the equipment from the energy source and by the plug being under the exclusive control of the employee performing the servicing or maintenance.
- Hot tap operations involving transmission and distribution systems for substances such as gas, steam, water or petroleum products when they are performed on pressurized pipelines, provided that University of New Haven demonstrates that 1) continuity of service is essential, 2) shutdown of the system is impractical; and 3) documented procedures are followed, and special equipment is used which will provide proven effective protection for employees.

1.2 Review

The Associate Vice President of Public Safety & Administrative Service with the assistance of the Associate Vice President of Facilities will annually review the LOTO program for effectiveness and

amend as necessary.

1.3 Policy

It is the responsibility of University of New Haven employees to comply with the restrictions and limitations imposed upon them during the use of LOTO. Authorized employees are required to perform LOTO in accordance with these procedures outlined in this program. All employees, upon observing a machine or piece of equipment which is locked out or tagged out to receive servicing shall not attempt to start, energize or use that machine or equipment.

2.0 Definitions

Affected employee: An employee whose job requires him/her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him/her to work in an area in which such servicing or maintenance is being performed.

Authorized employee: A person who locks out or tags out machines or equipment in order to perform service or maintenance on that machine or equipment. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section. Authorized employees at the University include electricians and other licensed tradesmen.

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.

Lockout device: A device that utilizes a positive means such as a lock, either key or combination type, to hold an energy isolating device in the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

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

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 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 prominent warning device, such as a tag and a means of attachment, which can be securely fastened to 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.

3.0 Roles and Responsibilities

3.1 Associate Vice President of Public Safety & Administrative Services

- Assure LO/TO program is reviewed on an annual basis.

3.2 Associate Vice President of Facilities

- Implementation and administration of this LO/TO program.
- Assure all facilities personnel affected are trained on the LO/TO policy and procedures.
- Review procedures to ensure compliance.

3.3 Director of Facilities (or designee)

- Develop and conduct training on the procedures and requirements of this Hazardous Energy Control Program with supervisors.
- Assure LO/TO training has been completed by employees who will be implementing LO/TO procedures. Training must be documented (employee name, ID, sate, subject matter, trainer) and information should be kept on file in within the Facilities department training files.
- Assure training records are maintained in the facilities training records database.
- Assist supervisors with the development of hazardous energy control procedures for applicable machines and equipment as well.
- Responsible for assuring that untrained employees do not receive authorization to utilize LO/TO or perform maintenance and repair requiring it.
- Responsible for ensuring all authorized LO/TO technicians are provided with the proper equipment and personal protective equipment (PPE) to perform the job safely.
- Inform contractors that the workplace contains equipment with hazardous energy sources.

3.4 Facility Supervisors and Managers

- Thoroughly train all employees whose job requires them to work with or near machines or equipment on which LO/TO is necessary.
- Periodically audit the LO/TO program to assure that technicians are following University LO/TO procedures.
- Assure LO/TO tracking binder is being maintained within the Facility department office.
- Assure contractors are adhering to a LO/TO program.

3.5 Employees

- Attend training and comply with the requirements of this program.
- Follow safe work practices while performing work on equipment with hazardous energy sources.
- Report to their supervisors any unsafe conditions concerning the control of hazardous energy sources.
- Ask their supervisor for assistance or clarification of work procedures as necessary.

3.6 Outside Personnel (contractors, etc.)

- Ensure contractor personnel have an OSHA compliant LO/TO policy which outlines procedures and that affected staff understand the requirements.
- The Project Manager will ensure that the contractor has an OSHA compliant LO/TO policy available.
- The University of New Haven and outside personnel will inform each other of their respective lockout or tagout procedures.
- The University of New Haven will ensure that their employees comply with the restrictions and prohibitions of the outside employer's energy control program.
- Coordinate any utility or system shut-down with the Director of Facilities or designee.

4.0 When to Lockout

If an energy isolating device is capable of being locked out, the University of New Haven energy control program will utilize lockout, unless the University of New Haven can demonstrate that the utilization of a tagout system will provide full employee protection. Whenever replacement, major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices must be designed to accept a lockout device.

5.0 When to Tagout

If an energy isolating devices is not capable of being locked out, employees must utilize the tagout system. When a tagout device is used on an energy isolating device which is capable of being locked out, the tagout device must be attached at the same location that the lockout device would have been attached. The University of New Haven will demonstrate that the tagout program will provide a level of safety equivalent to that obtained by using a lockout program.

In demonstrating that a level of safety is achieved in the tagout program which is equivalent to the level of safety obtained by using a lockout program, the University of New Haven will demonstrate full compliance with all tagout-related provisions of OSHA Standard 29 CFR1910.147 together with such

additional elements as are necessary to provide the equivalent safety available from the use of a lockout device. Additional means to be considered as part of the demonstration of full employee protection includes the implementation of additional safety measures such as the 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 energization.

6.0 Energy Control Procedure

Procedures will be developed, documented and utilized for the control of potentially hazardous energy for applicable equipment and machinery at the University of New Haven.

6.1 Exceptions

The University of New Haven does not require specific procedures for machines or equipment, when all of the following elements exist:

- Personnel are trained to recognize an energy hazard exists through licensed training (e.g. Licensed Mechanic).
- The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down which could endanger employees;
- The machine or equipment has a single energy source which can be readily identified and isolated;
- The isolation and locking out of that energy source will completely deenergize and deactivate the machine or equipment;
- The machine or equipment is isolated from that energy source and locked out during servicing or maintenance;
- A single lockout device will achieve a locked-out condition;
- The lockout device is under the exclusive control of the authorized employee performing the servicing or maintenance;
- The servicing or maintenance does not create hazards for other employees; and
- The University of New Haven, in utilizing this exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

6.2 Procedure Requirements

Lockout or tagout must only be performed by the authorized employees who are performing the servicing or maintenance where procedures must be equipment and or machine-specific, meaning

each piece of equipment must have its own procedure; the 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.

The basis to developing simple procedures is to make them as easy as possible to follow. Using a standardized format and including photos or diagrams helps to simplify the procedure writing process and it is easier to update procedures. Sub-procedures may be used to make a procedure simpler and shorter. Procedures may reference an operator's manual concerning shutdown operations. The key to sub-procedures is to make them as concise and clear as possible, while reducing the amount of information in the original procedure.

6.3 Control and Shutdown

Procedure requirements include, but are not limited to the following:

- The authorized employee will notify the affected employees of the application and removal of LOTO devices. Notification is given before the controls are applied and after they are removed.
- A specific statement of the intended use of the procedure.
- Specific procedural steps for preparing for shutdown. The authorized employee must have the 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.
- The machine or equipment must be turned off or shut down using the procedures established for the machine or equipment.
- All energy isolating devices that are needed to control the energy to the machine or equipment must be physically located and operated to isolate the equipment from the energy source(s).

6.4 Equipment, Locks and Tags

Whenever major replacement, repair, renovation or modification of machinery, equipment or system is performed, and whenever new equipment is installed, energy isolating devices must be in place which accept a lockout device.

6.4.1 Safety Locks

- Safety locks shall be provided for maintenance, various operating departments and service area personnel who will be working on locked out equipment. All locks must be single key only. Individuals receiving locks are responsible for these locks which must only be used for LO/TO.
- Initial isolation by watch engineers or distribution personnel may be accomplished using a

multi-keyed lock. However, IN ALL CASES, A SINGLE KEYED LOCK MUST BE APPLIED BY THE INDIVIDUAL SERVICING EMPLOYEE PRIOR TO INITIAL SERVICING.

- Lockout devices will be substantial enough to prevent removal without the use of excessive force and will be able to withstand the environment in which they are likely to be used.
- Multiple hasp devices will be provided in the event that multiple individuals are participating in the servicing or maintenance operations.

6.4.2 Lockout Tags

- Easily identifiable standardized lockout tags will be provided to all applicable department and service areas.
- Tags must have a standard format and print which contains a legend warning against hazardous conditions if equipment is energized, and a place to identify who applied the device, the date, and the LO/TO log number. A tag will be attached to each lock applied.
- Tagout tags provided will be capable of withstanding environmental conditions for the entire period of use. Wet or damp conditions or corrosive environments can cause rapid deterioration and, therefore, will be considered when selecting appropriate tags.
- Tagout devices will be substantial enough to prevent inadvertent or accidental removal. Tags must be attached with a non-reusable and non-releasable, self-locking all-environment nylon cable ties with a minimum unlocking strength of 50 pounds.

6.5 Testing or Positioning of Machines, Equipment, or Components

When LO/TO devices need to be temporarily removed from the energy isolating device and the machine or equipment energized to test or position the machine, equipment or component, the following sequence of actions must be followed:

- Clear the machine or equipment of tools and materials.
- Remove employees from the machine or equipment area.
- Remove the LO/TO devices.
- Energize and proceed with testing or positioning.
- Deengergize all systems and reapply energy control measures to continue the servicing and/or maintenance.

6.6 Group Lockout or Tagout

When servicing and/or maintenance is performed by a crew, craft, department or other group, they must utilize a procedure which affords the employees a level of protection equivalent to that

provided by the implementation of a personal LO/TO device.

Primary responsibility is vested in an authorized UNH employee for a set number of employees working under the protection of a group LO/TO device. A provision for the authorized employee is to ascertain the exposure status of individual group members with regard to the lockout or tagout of the machine or equipment. When more than one crew, craft, department, etc. is involved, assignment of overall job-associated lockout or tagout control is the responsibility of the authorized employee designated to coordinate affected work forces and ensure continuity of protection. Each authorized employee must affix a personal LO/TO device to the group LO/TO device, group lockbox, or comparable mechanism when he or she begins work, and must remove those devices when he or she stops working on the machine or equipment being serviced or maintained.

6.7 Shift or Personnel Changes

Specific procedures must be utilized during shift or personnel changes to ensure the continuity of lockout or tagout protection, including provisions for the orderly transfer of LO/TO device protection between off-going and oncoming employees, to minimize exposure to hazards from the unexpected energization or startup of the machine or equipment, or the release of stored energy.

7.0 Protective Materials and Hardware

Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners or other hardware are provided by the University of New Haven to licensed technicians for isolating, securing or blocking of machines or equipment from energy sources. Lockout devices and tagout devices will be singularly identified; the only devices(s) used for controlling energy, and not be used for other purposes. These devices will meet the following requirements:

- Durable;
- Capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected;
- Standardized in at least one of the following criteria: color, shape, or size;
- Tagout devices should have standardized print and format; and
- Lockout devices and tagout devices indicate the identity of the employee applying the device(s).

7.1 Tagout Devices

- Tagout devices will 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.

- Tagout devices should have standardized print and format.
- Tags will not deteriorate when used in corrosive environments such as areas where acid and alkali chemicals are handled and stored.
- Means of attachment will be substantial enough to prevent inadvertent or accidental removal.
- Tagout device attachment means will 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.
- Tagout devices shall warn against hazardous conditions if the machine or equipment is energized and will include a legend such as the following: Do Not Start. Do Not Open. Do Not Close. Do Not Energize. Do Not Operate.

7.2 Lockout Devices

- Lockout devices will 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.

8.0 Lockout/Tagout Procedure

All LO/TO activity must be recorded in the logbook located in the Facility department office.

Authorized facility department personnel will assign a LO/TO activity number which will remain consistent until the LO/TO is terminated. This number will include the date and a sequence number for the activity. The LO/TO number will remain constant for all tags and records relating to this operation for the duration of the activity.

An example of the log procedure follows: A piece of equipment is undergoing electrical maintenance on January 2, 2012 and requires LO/TO. The electrician completing the work would initiate the activity by requesting a LO/TO number from the facilities department. Assuming that this is the first LO/TO of the day, the Facilities department would assign the number LO-010212-01.

- Numbers identifying subsequent LO/TO operations initiated on the same day will have a sequentially different last digit (e.g., 010208-02).
- A copy of the LO/TO Log Sheet can be found in Appendix A of this document.

8.1 Placement of Locks and Tags

- LO/TO procedures will only be utilized by trained authorized individuals performing servicing or maintenance.
- Lockout ***in conjunction with*** tagout is the preferred method of assuring continued zero energy levels; equipment will be isolated using this method prior to maintenance on all machinery and equipment whenever possible.
    - Each authorized employee who will service equipment will attached a lockout device ***and*** a lockout tag on each isolating device.
    - If there is no feasible means of locking out equipment, a tag must be placed in such a way as to indicate the equipment is not to be energized.
- Notify all employees working with or near affected machines that a LO/TO is going to be utilized, the reason for the lockout, and the affected systems.
- Authorized individuals performing the maintenance or repair should apply their personally assigned lock and tag to the lockable breaker device, disconnect lever or other device.
    - Each lock shall be accompanied by a tag with the owner's name, date, log number, and purpose (e.g., meg motor, isolated for maintenance, service pump seal).
    - Each individual will maintain key control.
- A push button, selector switch or other circuit device shall not be considered a lockout device.
- If multiple employee's/trades are involved, then multi-lock device (hasp) shall be used to accommodate each lock.
    - Each employee involved in the job shall apply his or her own locks and tag.
    - Each tag must state the employee's name, date, LO/TO log number and purpose (e.g., meg motor, isolated for maintenance, service pump seal).
- When a multiple hasp cannot be applied to the energy-isolating device, a single lock/lockout tag may lock the device by the department supervisor and the key to that lock secured in a lock box.
    - ***Once in place, a lock shall not be removed by anyone other than the owner.***

8.2 Removal of Locks and Tags

- As each person completes his/her work, the employee removes the lock and tag and notifies the Facility department that they are signing off the lockout. When the last lock and tag is removed and equipment is cleared of all locks, tools, or other equipment, the department and /or employees of affected area shall again be notified before re-energizing.
- When work is to continue beyond a shift, the authorized employee who is leaving removes his/her lockout device and lockout tag and the employee starting on the job or shift installs his/her lockout device and lockout tag. The Facility department must be notified of this activity.

The only locks that may remain on a piece of equipment beyond one shift are the utilities locks, which will be removed upon completion of the entire servicing.

- No other individual's lock may be removed except in situations outlined in Section 8.3. ***Unauthorized removal of any lockout device and/or lockout tag is cause for severe disciplinary action.***
- If upon completion of a job, a lockout device and lockout tag has not been removed, the supervisor of the authorized employee will contact the employee involved and make certain it is safe to remove them.

8.3 Unreachable Authorized Employee

If this authorized employee cannot be contacted, the decision to remove the lockout device and lockout tag shall be made by the Director of Facilities. This is done only after insuring the equipment is clear and safe.

9.0 Annual Inspection

The University of New Haven Director of Facilities will conduct an inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of the OSHA Standard 29 CFR1910.147 are being followed. The inspection is also conducted to correct any deviations or inadequacies identified.

Where lockout is used for energy control, the inspection includes a review, between the inspector and each authorized employee, of that employee's responsibilities under the energy control procedure being inspected.

Where tagout is used for energy control, the periodic inspection includes a review, between the inspector and each authorized and affected employee, of that employee's responsibilities under the energy control procedure being inspected.

The University of New Haven will certify that the periodic inspections have been performed. The certification identifies the machine or equipment on which the energy control procedure was being utilized, the date of the inspection, the employees included in the inspection, and the person performing the inspection.

10.0 Training

The Facility department supervisors provide training to ensure that the purpose and function of the

LO/TO program are understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees. The training includes the following:

- Each *authorized* employee will receive training in the 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.
- Each *affected* employee will be instructed in the purpose and use of the energy control procedure.
- All *other* employees whose work operations are or may be in an area where energy control procedures may be utilized, will be instructed about the procedure, and about the prohibition relating to attempts to restart or reenergize machines or equipment which are locked out or tagged out.

When tagout systems are used, employees will also be trained in the following limitations of tags:

- Tags are essentially warning devices affixed to energy isolating devices, and do not provide the physical restraint on those devices that is provided by a lock.
- When a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized person responsible for it, and it is never to be bypassed, ignored, or otherwise defeated.
- Tags must be legible and understandable by all authorized employees, affected employees, and all other employees whose work operations are or may be in the area, in order to be effective.
- Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.
- Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.
- Tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.

10.1 Employee Retraining

Retraining will be provided for all authorized and affected employees 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 energy control procedures.

Additional retraining will also be conducted whenever an inspection reveals, or whenever the Director of Facilities or designee has reason to believe that there are deviations from or inadequacies in the employee's knowledge or use of the energy control procedures.

The retraining will reestablish employee proficiency and introduce new or revised control methods and procedures, as necessary.

The Director of Facilities or designee will certify that employee training has been accomplished and is being kept up to date. The certification contains each employee's name and dates of training.

11.0 Contractors

Outside contractors shall comply with these procedures. In addition, the University of New Haven employee in charge of bringing an outside contractor onto the University campus shall notify the appropriate department supervisor prior to and following any lockout of equipment. All initial equipment isolation must be completed by University of New Haven personnel.

Appendix A

Equipment Specific Procedure

for

University of New Haven

(Date)

Machine Identification

General Description: _____

_____

Manufacturer: _____

_____

Model Number: _____

Serial Number:* _____

_____

** If more than one piece of same equipment, list all serial numbers.*

Location of equipment: _____

_____

Operator Controls

The types of controls available to the operator need to be determined. This should help identify energy sources and lockout capacity for the equipment.

List types of operator controls: _____

_____

_____

_____

_____

_____

Energy Sources

The energy sources, such as electrical, steam, hydraulic, pneumatic, natural gas, stored energy, etc.) present on this equipment are:

ENERGY SOURCE	LOCATION	Lockable Yes	Lockable No	Type lock or block needed

Shutdown Procedures

List the steps in order necessary to shut down and de-energize the equipment. Be specific. For stored energy, be specific about how the energy will be dissipated or restrained.

Procedure: _____

_____

Lock Type & Location: _____

_____

How Will De-energized State Be Verified? _____

_____

_____

_____

_____

NOTIFY ALL AFFECTED EMPLOYEES WHEN THIS PROCEDURE IS IN APPLICATION.

Start Up Procedures

List the steps in order necessary to reactivate (energize) the equipment. Be specific.

Procedure: _____

_____

_____

_____

Energy Source Activated: _____

_____

_____

_____

_____

NOTIFY ALL AFFECTED EMPLOYEES WHEN THIS PROCEDURE IS IN APPLICATION.

Procedures For Operations and Service/Maintenance

List those operations where the procedures above do not apply [See 29 CFR 1910.147 (a)(2)]. Alternate measures which provide effective protection must be developed for these operations. Job Safety Analysis is one method of determining appropriate measures.

Operation Name: _____

_____

_____

_____

_____

_____

Affected and Authorized Employees

List each person affected by this procedure and those authorized to use this procedure.

AFFECTED EMPLOYEES	
Name	**Job Title**

AUTHORIZED EMPLOYEES	
Name	**Job Title**

Approved by Date

Approved by Date