

Title: Lockout/Tag out Control of Hazardous Energy Procedure

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Issuing Authority: VP, Facilities and Construction Management

Responsible Officer: Director Environmental Health and Safety

PURPOSE OF THE PROCEDURE

The purpose of New York University's Lockout/Tagout Program is to protect employees from exposure to the unexpected energizing or startup of equipment, or release of hazardous energy, during servicing and maintenance, and to comply with the Occupational Safety and Health Administration (OSHA) Lockout/Tag out Standard, 29 CFR 1910.147.

SCOPE OF THIS PROCEDURE

This procedure covers the servicing and maintenance of machines and equipment in which the unexpected energizing or start-up of the machines or equipment, or release of stored energy, could cause injury to employees. This procedure establishes minimum performance requirements for the control of such hazardous energy.

EXCEPTIONS

This procedure does not apply to work on cord and plug connected electric equipment for which exposure to the hazards of unexpected energizing 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.

This procedure does not apply to 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 the University 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.

WHO NEEDS TO KNOW THIS PROCEDURE

All New York University academic, commercial and residential facilities.

PROCEDURES FOR IMPLEMENTATION

Responsibilities:

Department of Environmental Health and Safety

Environmental Health & Safety will be responsible for developing this procedure and communicating the requirements of this procedure to NYU personnel who utilize lockout/tagout procedures.

Facilities Manager, Department Manager, Construction Manager and Supervisors

The supervisor shall be responsible for the safe practice of all processes involving hand held and powered hand tools. Applicable regulations shall be followed. (Note: for practical purposes, the term "tool" shall mean powered and non-

powered tools unless otherwise designated)

Maintenance and Housekeeping Personnel

No Maintenance or Housekeeping personnel should ever touch a lockout/tagout valve, system, knob, lever or other infrastructure. Awareness level training on lockout/tagout should be given to all personnel that may come across a locked out device or system. Only the individual that initially locked out a device or system should remove that lock and passer-bys should be aware never to touch a lockout/tagout on any device or system.

PROCEDURE DEFINITIONS

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

Authorized employee. A person who locks and tags out machines and equipment in order to perform servicing or maintenance. An affected employee becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this procedure.

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 repair, maintenance and service 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 a safe position and prevent the energizing of the machine or equipment. Included are blank flanges and bolted slip blinds.

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

un-jamming of machines or equipment and making adjustments or tool changes, where the employee may be exposed to the unexpected energizing or start-up of the equipment or a release of hazardous energy.

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

UNIVERSITY PROCEDURE

Energy Control Program

Each facilities manager and the CoGen Plant shall establish a program consisting of energy control procedures, employee training and periodic inspections to ensure that before any employee performs any servicing or maintenance on a machine or equipment where the unexpected energizing, start-up or release of stored energy could occur and cause injury, the machine or equipment shall be isolated from the energy source, and rendered inoperative.

Lockout/Tag out

1. If an energy-isolating device is capable of being locked out, the energy control procedures shall utilize lockout and tagout. If an energy-isolating device is not capable of being locked out, the energy control program shall utilize a tagout.
2. Whenever replacement or major repair, renovation or modification of a machine or equipment is performed, and whenever new machines or equipment are installed, energy isolating devices for the machines or equipment shall be designed to accept lockout devices.

Energy Control Procedure

1. Procedures shall be developed, documented and utilized for the control of potentially hazardous energy when employees are engaged in the activities covered by this procedure.
2. Exception
 - a. Facility departments and the CoGen Plant 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; (3) the isolation and locking out of that energy source will completely de-energize 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; (7) the servicing or maintenance does not create hazards for other employees; and (8) the facility department or CoGen Plant, in utilizing this exception, has had no accidents involving the unexpected activation or re-energizing of the machine or equipment during servicing or maintenance
3. The procedures shall 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 including, but not limited to, the following:
 - a. A specific statement of the intended use of the procedure;
 - b. Specific procedural steps for shutting down, isolating, blocking and securing machines or equipment to control hazardous energy;
 - c. Specific procedural steps for the placement, removal and transfer of lockout/tagout devices and the responsibility for them; and

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

Protective Materials and Hardware:

1. Locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware shall be provided by the facility departments and the CoGen Plant for isolating, securing and blocking machines and equipment from their energy sources.
2. Lockout/tagout devices shall be singularly identified, shall be the only devices used for controlling energy and shall not be used for other purposes. Lockout/tagout devices shall be durable, standardized, substantial and identifiable.
 - a. Durable. Lockout/tagout devices shall be capable of withstanding the environment to which they are exposed for the maximum period of time that exposure is expected. 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.
 - b. Standardized. Lockout/tagout devices shall be standardized within the facility departments and the CoGen Plant in at least one of the following criteria: color, shape or size. Additionally, in the case of tagout devices, the print and format shall be standardized.
 - c. 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. Tagout devices and their means of attachment shall be substantial enough to prevent inadvertent or accidental removal. The tag attachment means shall be non-reusable, attachable by hand, self-locking, non-releasable with a minimum unlocking strength of not less than 50 pounds and have the general design and basic characteristics of being at least equivalent to a one-piece, all- environment-tolerant nylon cable tie.
 - d. Identifiable. Lockout/tagout devices shall indicate the identity of the employee applying the device.

Periodic Inspection

1. The facility departments and the CoGen Plant, with the assistance of Environmental Health and Safety, shall conduct a periodic inspection of the energy control procedure at least annually to ensure that the procedure and the requirements of this procedure are being followed.
 - a. The periodic inspection shall be performed by an authorized employee other than the one(s) utilizing the energy control procedure, and a member of Environmental Health and Safety.
 - b. The periodic inspection shall be conducted to correct any deviations or inadequacies identified.
 - c. The periodic inspection shall include a review with each authorized employee of that employee's responsibilities under the energy control procedure being inspected.
2. The facility departments and the CoGen Plant shall certify that the periodic inspections have been performed. The certification shall identify 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 persons performing the inspection.

Training and Communication:

1. Facility departments and the CoGen Plant shall provide training to ensure that the purpose and function of the energy control program are understood by employees and that the knowledge and skills required for

the safe application, usage and removal of energy controls are acquired by employees. The training shall include the following:

- a. Each authorized employee shall 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;
 - b. Each affected employee shall be instructed in the purpose and use of the energy control procedure;
 - c. All other employees whose work operations are or may be in an area where energy control procedures may be used shall be instructed about the procedure and the prohibition against attempting to restart or re-energize machines or equipment, which are locked or tagged out.
2. When tagout systems are used (i.e., on machines or equipment that are incapable of being locked out), employees shall also be trained in the following limitations of tags:
- a. 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;
 - b. when a tag is attached to an energy isolating means, it is not to be removed without authorization of the authorized employee responsible for it, and it is never to be bypassed, ignored or otherwise defeated;
 - c. in order to be effective, 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;
 - d. tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace;
 - e. tags may evoke a false sense of security; therefore, their meaning must be understood as part of the overall energy control program;
 - f. tags must be securely attached to energy isolating devices so that they cannot be inadvertently or accidentally detached during use.
3. Employee Re-Training
- a. Facility departments and the CoGen Plant shall re-train 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.
 - b. Additional re-training shall also be conducted whenever a periodic inspection reveals, or whenever a facility or the CoGen Plant has reason to believe, that there are deviations from or inadequacies in employee knowledge or use of the energy control procedures.
 - c. The re-training shall establish employee proficiency and introduce new or revised control methods and procedures, as necessary.
 - d. Facility departments and the CoGen Plant shall certify that employee training has been accomplished and is being kept up to date. The certification shall contain each employee's name and the dates of training.

Energy Isolation

Lockout/tagout shall be performed only by the authorized employees who are performing the servicing or maintenance.

Notification of Employees

Authorized employees shall notify affected employees of the application and removal of lockout/tagout devices. Notification shall be given before the controls are applied to, and after they are removed from the machine or equipment.

Application of Energy Control

The established procedures for the application of energy control (lockout/tagout procedures) shall cover the following elements and actions shall be done in the following sequence.

1. Preparation for Shutdown
 - a. Before an authorized or affected employee turns off a machine or equipment, the authorized employee 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.
2. Machine or Equipment Shutdown
 - a. The machine or equipment shall be turned off or shut down using the procedures established for the machine or equipment. An orderly shutdown must be used to avoid any additional or increased hazards to employees as a result of the equipment stoppage.
3. Machine or Equipment Isolation
 - a. All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source(s)
4. Lockout/Tagout Device Application
 - a. Lockout and tagout devices shall be affixed to each energy-isolating device by authorized employees.
 - b. Lockout devices shall be affixed in a manner that will hold the energy isolating devices in a "safe" or "off" position.
 - c. Tagout devices 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.
5. Stored Energy
 - a. Following the application of lockout/tagout devices to energy isolating devices, all potentially hazardous stored or residual energy shall be relieved, disconnected, restrained and otherwise rendered safe.
 - 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.
6. Verification of Isolation
 - a. Prior to starting work on machines or equipment that have been locked and tagged out, the authorized employee shall verify that isolation and de-energizing of the machine or equipment has been accomplished.

Release from Lockout/Tagout

Before lockout and tagout devices are removed and energy is restored to the machine or equipment, procedures shall be followed and actions taken by the authorized employee(s) to ensure the following:

1. The Machine or Equipment
 - a. The work area shall be inspected to ensure that non-essential items have been removed and to ensure that machine or equipment components are operationally intact.
2. Employees

- a. The work area shall be checked to ensure that all employees have been safely positioned or removed.
- 3. After lockout and tagout devices have been removed and before a machine or equipment is started, affected employees shall be notified that the lockout and tagout devices have been removed.
- 4. Removal of Lockout/Tagout Devices
 - a. Each lockout and tagout device shall be removed from each energy-isolating device by the authorized employee who applied the device.
 - b. Exception. When the authorized employee who applied the lockout and tagout devices is not available to remove them, the devices may be removed under the direction of the facility department or the CoGen Plant provided that specific procedures and training for such removal have been developed, documented and incorporated into the facility department's or CoGen Plant's energy control program. The facility department or CoGen Plant shall demonstrate that the specific procedure provides a level of safety equivalent to the removal of the devices by the authorized employee who applied them. The specific procedure shall include at least the following elements:
 - i. verification by the facility department or the CoGen Plant that the authorized employee who applied the devices is not at the facility;
 - ii. making all reasonable efforts to contact the authorized employee to inform him or her that his or her lockout/tagout devices have been removed; and
 - iii. ensuring that the authorized employee has this knowledge before he or she resumes work at the facility.

Additional Requirements

- 1. Testing or Positioning of Machines, Equipment or Components
 - a. In situations in which lockout/tagout devices must be temporarily removed from an energy isolating device and the machine or equipment energized to test or position the machine, equipment or component, the following sequence of actions shall be followed:
 - i. clear the machine or equipment of tools and materials;
 - ii. remove employees from the machine or equipment area;
 - iii. remove the lockout/tagout devices;
 - iv. energize and proceed with testing or positioning;
 - v. de-energize all systems and re-apply the energy control measures to continue the servicing and/or maintenance of the machine or equipment.
- 2. Outside Personnel (Contractors, etc.)
 - a. Whenever outside servicing personnel are to be engaged in activities covered by the scope and application of this standard, the facility department or the CoGen Plant and the outside employer shall inform each other of their respective lockout/tagout procedures. This should be accomplished during the bidding or estimating stage of any project.
 - b. The facility department or CoGen Plant shall ensure that its employees understand and comply with the restrictions and prohibitions of the outside employer's energy control program.
- 3. Group Lockout/Tagout
 - a. When servicing or maintenance is performed by a crew, craft, department or other group, a procedure, which affords the employees a level of protection equivalent to, that provided by the implementation of personal lockout/tagout devices shall be used.
 - b. Group lockout/tagout devices shall be used in accordance with the procedures listed below including, but not limited to, the following specific requirements:
 - i. primary responsibility shall be vested in an authorized employee for a set number of employees working under the protection of a group lockout/tagout device (such as an

operations lock); and provision shall be made for the authorized employee to ascertain the exposure status of individual group members with regard to the lockout/tagout of the machine or equipment; and

- ii. when more than one crew, craft, department, etc. is involved, assignment of overall job-associated lockout/tagout control responsibility shall be made to an authorized employee designated to coordinate affected work forces and ensure continuity of protection; and
- iii. each authorized employee shall affix a personal lockout/tagout device to the group lockout device, group lockbox or comparable mechanism when he or she begins work, and shall remove the device when he or she stops working on the machine or equipment being serviced or maintained.

4. Shift or Personnel Changes

- a. Specific procedures shall be utilized during shift or personnel changes to ensure the continuity of lockout/tagout protection, including provision for the orderly transfer of lockout/tagout device protection between exiting and in-coming employees to minimize exposure to hazards from the unexpected energizing or start-up of the machine or equipment, or the release of stored energy.

RELATED POLICIES

NYU Environmental Health and Safety Policy

RELEVANT RESOURCES