



# ENERGY CONTROL LOCKOUT/TAGOUT PROGRAM 2012



**NEW YORK CITY  
COLLEGE OF  
TECHNOLOGY**



## Energy Control Lockout / Tagout Program

### 1. INTRODUCTION

The New York City College of Technology Environmental Health and Safety (EHS) office has implemented the rules, regulations and other mandated practices in this protocol to control operations that involve work in areas containing hazardous energy. The Lockout / Tagout Program has been created to promote a safe work atmosphere and to comply with the Occupational Safety and Health Administration (OSHA) Control of Hazardous Energy (Lockout / Tagout) Standard (29 Code of Federal Regulations 1910.147).

### 2. TABLE OF CONTENTS

Chapter	Heading	Page
1.0	– Introduction	1
2.0	– Table of Contents	1
3.0	– Objective	1
4.0	– Applicability	2
5.0	– Written Energy Control Procedures	3
6.0	– Lockout / Tagout Procedure	4
7.0	– Removal of Lockout / Tagout Devices	5
8.0	– Personnel or Shift Changes	5
9.0	– Testing or Positioning of Machines or Equipment	6
10.0	– Group Lockout / Tagout Procedure	6
11.0	– Outside Personnel or Contractors	7
12.0	– Protective Materials and Hardware	7
13.0	– Training	8
14.0	– Retention, Availability, and Revisions	8
15.0	– Definitions	8
16.0	– References	10
Appendix A	Lockout / Tagout Inspection Form	11
Appendix B	Lockout / Tagout Checklist	12
Appendix C	Restoring Equipment to Service	13
Appendix D	Example Tag	14

### 3. OBJECTIVE

Lockout / tagout programs are designed to prevent accidental startup of machines or equipment, and to prevent the release of stored energy during servicing or maintenance. Through the use of specific procedures that involve applying locks and tags, equipment is isolated from energy sources and injuries to workers are prevented. While lockout and tag is the preferred method of isolating machines or equipment from energy sources, tagout is permitted when the energy isolating devices are not lockable. Tagout may not be used when the energy isolating devices are lockable. The energy switches for new equipment or equipment that has undergone major repairs, renovation, or modification after January 2, 1990 must accept a lockout device.



## 4. APPLICABILITY

The lockout / tagout program consists of the following components:

- Energy control procedures
- Employee training
- Periodic inspections

The program must be strictly followed when it is necessary to work on any equipment that may release any form of hazardous energy including, but not limited to, electrical, rotational, mechanical, chemical, hydraulic, or pneumatic energy, while the equipment is shut down.

### EMPLOYEE CLASSIFICATIONS:

Employees are considered to be either affected employees or authorized employees. Only authorized employees may lockout/tag or tagout equipment. Authorized employees must notify affected employees before the procedure is used and when the machine or equipment is returned to service. OSHA defines each as:

#### Affected Employees

Affected employees operate machinery or equipment upon which lockout / tagout is required under this program or whose job requires work in an area in which such servicing or maintenance is being performed.

#### Authorized Employees

Authorized Employees will lockout and tag or tagout (see above) machines or equipment in order to perform servicing or maintenance on that machine or equipment. It is likely for an individual to be considered authorized with regard to certain equipment in the workplace, but unauthorized (therefore affected) as to other equipment.

### PROGRAM EXCLUSIONS

The Control of Hazardous Energy Program does not apply to:

#### Cord and Plug-Connected Electrical Equipment:

Work on cord and plug-connected electric equipment if unplugging the equipment from the energy source controls exposure to the hazards of unexpected energization of the equipment and if the plug is under the exclusive control of the employee performing service or maintenance. Pneumatic tools may also fall into this category provided that they can be completely isolated from their energy source.

#### Hot Tap Operations:

Hot tap operations that involve transmission and distribution systems for gas, steam, water, or petroleum products when these activities are performed on pressurized pipelines; continuity of service is essential, and shutdown of the system is impractical; and employees are provided with an alternative type of protection that is equally effective.



### Minor Operations:

Minor tool changes, adjustments, and other minor servicing activities that take place during normal production operations that are routine activities, repetitive, and integral to the use of the production equipment, provided the work is performed using alternative measures that provide effective protection.

## 5. WRITTEN ENERGY CONTROL PROCEDURES

Energy control procedures must be developed, documented, and used to control potentially hazardous energy sources whenever workers perform activities covered by the standard. At a minimum the energy control procedures must include, but are not limited to, the following elements:

- A statement on how the procedure will be used
- The procedural steps needed to shut down, isolate, block, and secure machines or equipment
- The steps designating the safe placement, removal, and transfer of lockout/tagout devices and which employee has the responsibility for the lockout/tagout devices
- The specific requirements for testing machines or equipment to determine and verify the effectiveness of locks, tags, and other energy control measure.

### WRITTEN ENERGY CONTROL PROCEDURE EXCLUSIONS

Specific written procedures for a particular machine or piece of equipment are not required if **all** of the following elements exist:

1. The machine or equipment has no potential for stored or residual energy or reaccumulation of stored energy after shut down 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 must 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 must 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.
8. The department, in utilizing this exception, has had no accidents involving the unexpected activation or reenergization of the machine or equipment during servicing or maintenance.

Therefore, if the equipment has other conditions, such as multiple energy sources, different connecting means, or a particular sequence that must be followed to shut down the machine or equipment, then the employer must develop separate energy control procedures to protect employees.



## 6. LOCKOUT / TAGOUT PROCEDURE

Machines and equipment capable of receiving lockout / tagout must be properly locked out and tagged prior to servicing or maintenance. The general procedures for bringing machines and equipment to a neutral or zero energy state and subsequent lockout / tagout will be as follows:

### PREPARATION FOR SHUTDOWN:

Before an authorized or affected employee turns off a machine or piece of equipment, the authorized employee will 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. Additionally, the authorized employee will notify all affected employees that the machinery, equipment or process will be out of service and again notify all affected employees when the interruption in service has concluded.

### MACHINE OR EQUIPMENT SHUTDOWN:

An authorized or affected employee must turn off or shut down machine or equipment using orderly procedures established for that equipment.

### MACHINE OR EQUIPMENT ISOLATION:

An authorized employee must physically locate and operate all energy-isolating devices to isolate the machine from its energy source(s).

### INSPECTION OF LOCKOUT / TAGOUT DEVICE:

Prior to the application of any lockout/tagout device, the authorized employee will inspect each device for damage. If a device is determined to be damaged the authorized employee will obtain a new device from the supervisor. The damaged device will be surrendered to the supervisor and the supervisor will discard such device. Under no circumstances will a device be borrowed from another employee or will a device not specified for lockout/tagout be used.

### LOCKOUT / TAGOUT DEVICE APPLICATION:

An authorized employee must lock out and tag or tagout (for machines and equipment that cannot be locked out) each energy switch.

- Lockout devices must be affixed in a manner that will hold the energy isolating devices in a "safe" or "off" position
- Tagout devices must be affixed in a manner that will clearly indicate that the operation or movement of energy isolating devices from the "safe" or "off" position is prohibited
- If the tagout device can not be affixed directly to the energy isolating device, the tagout device must be located as close as safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device.



### STORED ENERGY:

After the energy-isolating device has been locked out and tagged or tagged out, all potentially hazardous stored energy must be relieved, disconnected, restrained, or otherwise rendered safe.

### VERIFICATION OF ISOLATION:

Prior to starting work on machines or equipment that have been locked and tagged or tagged out, an authorized employee must verify that isolation or de-energization of the machine or equipment has been accomplished

## **7. REMOVAL OF LOCKOUT / TAGOUT DEVICES**

The following procedures must be followed when removing lockout/tagout devices:

### RELEASE FROM LOCKOUT OR TAGOUT:

Before removing lockout or tagout devices and restoring energy, authorized employees must take these steps:

1. Inspect the work area to ensure that nonessential items have been removed and that the equipment components are intact.
2. Check the work area to make sure all employees are safely away from the equipment.
3. Notify affected employees after removing lockout or tagout devices and before energizing machines or equipment.
4. Notify affected employees after lockout or tagout devices and before starting a machine.

### LOCKOUT OR TAGOUT DEVICES REMOVAL:

The employee that applied the device must remove each lockout or tagout device from each energy-isolating device.

### EXCEPTION:

When the employee that applied the lockout/tagout devices is not available and the device must be removed, the following procedure must be used:

1. A supervisor must verify that the employee has left the campus.
2. The supervisor determines that the equipment or area is safe before the lockout/tagout is removed by ensuring that:
  - All tools have been removed
  - All guards have been replaced
  - All employees are free from any hazard before the lock and tag are removed and the machinery, equipment, or process, are returned to service
3. The supervisor must remove the lockout/tagout device.
4. All reasonable efforts must be made to contact and inform the employee that the lockout/tagout device has been removed.



5. The supervisor must ensure that the employee has been informed that the lockout/tagout device has been removed before the employee resumes work

## **8. PERSONNEL OR SHIFT CHANGES**

Many servicing and maintenance operations may extend across one or more work shifts. In such cases it is crucial that energy control procedures ensure that all hazardous energy is continuously maintained in a safe, deenergized condition. To maintain continuity in the protection provided to those involved in the lockout and tag procedure, and for the orderly transfer of the lockout and tag device, the steps below are necessary when personnel or shifts change.

### PERSONNEL CHANGE:

The arriving authorized employee's lock and tag shall be applied before the departing authorized employee's lock and tag are removed.

### SHIFT CHANGE:

The lock and tag of at least one authorized employee on the arriving shift shall be applied before any locks and tags of the departing shift are removed. The departing crew will inform the arriving crew of the status of the equipment and the work in progress

## **9. TESTING OR POSITIONING OF MACHINES OR EQUIPMENT**

If lockout devices and tags must be temporarily removed from energy-isolating devices in order to energize and test the equipment or to reposition any of its components, the authorized employee will:

1. Clear the equipment of tools and materials and have employees leave the equipment area.
2. Remove employees from the machine or equipment area in accordance with normal start-up procedures.
3. Remove the lockout devices and tags from the energy-isolating devices in accordance with the procedure set forth in this program.
4. Energize the equipment, and then proceed with testing the equipment or repositioning the components. De-energize all systems and continue with service or maintenance.

## **10. GROUP LOCKOUT / TAGOUT PROCEDURES**

During all group lockout/tagout operations where the release of hazardous energy is possible, the following procedures must be followed:

- A group lockout/tagout must afford each employee a level of protection equivalent to that provided by the implementation of a personal lockout or tagout device.
- A single authorized employee must be given primary responsibility for a set number of employees working under the protection of a group lockout or tagout device.
- The single authorized employee must determine the exposure status of individual group members.
- If there will be more than one crew, department, or group involved in the activity, a single authorized employee must be designated to coordinate affected workforces and to ensure continuity of protection.



- Each authorized employee must affix a personal lockout/tagout device to the machine or equipment when work begins and remove it when work is completed.

## **11. OUTSIDE PERSONNEL OR CONTRACTORS**

Outside personnel or contractors involved in service or maintenance operations covered by this program must submit lockout/tagout procedures to CUNY EHS and/or Buildings and Grounds. The college must inform the outside personnel or contractors of the lockout/tagout program used by the college. The college will ensure that all affected college employees understand and comply with the restrictions and prohibitions of the outside personal or contractor lockout/tagout procedures.

## **12. PROTECTIVE MATERIALS AND HARDWARE**

Departments must provide employees with the necessary protective materials and hardware to perform lockout/tagout. This may include locks, tags, chains, wedges, key blocks, adapter pins, self-locking fasteners, or other hardware. All devices used for lockout/tagout must be properly identified and must not be used for any other purposes. Lockout/tagout devices must also meet the following requirements:

### DURABLE:

Lockout/tagout devices must be capable of withstanding the environment to which they are exposed for the entire period of time that they are used. Tagout devices must be constructed 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 must not deteriorate when used in corrosive environments, such as areas where acid and alkali chemicals are used or stored.

### STANDARDIZED:

Lockout/tagout devices must be standardized within the department using at least one of the following criteria: Color, shape, or size; and, in the case of tagout devices, print and format.

### SUBSTANTIAL:

Lockout devices must 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 must be substantial enough to prevent inadvertent or accidental removal. Tagout devices must be attached with nylon cable ties that are non-reusable, self-locking, and non-releasable with a minimum unlocking strength of no less than 50 pounds.

### IDENTIFIABLE:

Lockout/tagout devices must identify the employee applying them.

### WORDING:

Tagout devices must warn against hazardous conditions if the machine or equipment is energized and include a wording such as the following: "Do Not Start. Do Not Open. Do Not Close. Do Not Energize. Do Not Operate."



### 13. TRAINING

All authorized and affected employees must receive initial training, as required. Retraining must be given for employees whenever there is a change in job assignment, a change in machines, equipment, or process that presents a new hazard, or a change in this lockout/tagout program. Retraining must also be given whenever the annual inspection identifies a deficiency in the procedures. Departments must ensure that all personnel involved in lockout/tagout procedures are trained.

### 14. RETENTION, AVAILABILITY AND REVISIONS

#### REVISIONS:

The lockout/tagout program will be reviewed at least annually by the Environmental Health and Safety Officer and updated when changes are warranted.

### 15. DEFINITIONS

**Affected Employees:** Those employees that operate machinery or equipment upon which lockout/tagout is required under this program or whose job requires work in an area in which such servicing or maintenance is being performed.

**Authorized Employees:** Only those employees certified to lockout/tagout equipment or machinery. For an employee to be considered authorized will depend upon various circumstances in the workplace. It is likely for an individual to be considered "authorized" with regard to certain equipment in the workplace, but "unauthorized" as to other equipment.

**Capable of being locked-out:** An energy-isolating device that 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 devices 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;
- Any similar device used to block or isolate energy.

Push buttons, selector switches and other control circuit type device are not energy isolating devices.

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



**Energy Control Procedure:** A written documentation that contains those items of information an authorized employee needs to know in order to safely control hazardous energy during servicing or maintenance of machines or equipment.

**Energy Control Program:** A program intended to prevent the unexpected energizing or the release of stored energy in machines or equipment on which servicing and maintenance is being performed by employees. The program consists of energy control procedure(s), an employee training program, and periodic inspections.

**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 accessories. 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 (e.g., circuit breaker or electrical power disconnect), 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 a machine or equipment. This prevents unauthorized personnel from turning on a machine or equipment while it is being serviced.

**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 that prepares a machine or a piece of equipment to regain its normal production operation.

**Tag:** The placement of a tagout device in addition to a lockout 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:** Tagout alone is permitted when the energy isolating devices are not lockable. Special procedures must be developed when a device cannot be locked out. Note: The energy switches for new equipment or equipment that has undergone major repairs, renovation, or modification after January 2, 1990 must accept a lockout device.

**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.



## **16. REFERENCES**

### **Occupational Safety and Health Administration**

Control of Hazardous Energy (Lockout / Tagout) Standard (29 CFR 1910.147)

## **APPENDIX A**

**Lockout / Tagout Inspection Form** – See page 11

## **APPENDIX B**

**Lockout / Tagout Checklist** – See page 12

## **APPENDIX C**

**Equipment Re-Energizing Checklist** – See page 13

## **APPENDIX D**

**Equipment Re-Energizing Checklist** – See page 1



## New York City College of Technology Lockout / Tagout Inspection Form

<b>Inspection Date</b>	
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<b>Inspector (Print Name)</b>	<b>(Signature)</b>

<b>Employee(s) Inspected (Print Name)</b>	<b>(Signature)</b>

<b>Machine/equipment on which the energy control procedure was being utilized:</b>

<b>Inspection Item</b>	<b>Yes</b>	<b>No</b>
Does employee have or have access to adequate lockout/tagout devices?		
Has employee tested the effectiveness of his/her lockout/tagout devices?		
Has employee received lockout/tagout training in the last year?		
If this is an outside contractor, has a supervisor or project manager informed him/her of the necessity for adhering to these procedures?		
Have all procedures been followed?		
Were tagouts legible and clearly displayed?		

<b>Comments / Observations</b>



## New York City College of Technology Lockout / Tagout Checklist


When servicing or maintaining machinery or equipment, the following steps must be taken.

Notification			
I have notified all affected employees that a lockout is required and the reason(s) for the lockout.			
Date	Time	Print Name	Signature

Shutdown			
I understand the reason the equipment is to be shutdown following normal procedures.			
Date	Time	Print Name	Signature

Disconnection of Power Sources			
I have operated the switch, valve, or other energy isolating device(s) so that each energy source (electrical, mechanical, hydraulic, etc.), has been disconnected or isolated from the equipment. I have dissipated or restrained by methods such as grounding, repositioning, blocking, bleeding down, etc. all stored energy (such as capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems and air, gas, steam or water pressure).			
Date	Time	Print Name	Signature

Lockout and Tag			
I have locked out and tagged the energy isolating devices with assigned individual locks.			
Date	Time	Print Name	Signature

Safety Check			
After ensuring that no personnel are exposed, and as a check on having disconnected all energy sources, I have operated the start button or other normal operating controls to make certain the equipment will not operate.			
Date	Time	Print Name	Signature

**THE EQUIPMENT IS NOW LOCKED OUT**



## New York City College of Technology Equipment Re-energizing Checklist

When the servicing or maintenance is completed and the machine or equipment is ready to return to normal operating condition, the following steps must be taken.

### Job Completion / Certification

I have checked the machine or equipment and the immediate area around the machine to ensure that nonessential items have been removed and that the machine or equipment components are operationally intact.

Date	Time	Print Name	Signature
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### Equipment / Personnel Check

The work area has been checked to ensure that all employees have been safely positioned or removed from the area.

Date	Time	Print Name	Signature
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### Neutral Controls

Verify that the controls are in neutral.

Date	Time	Print Name	Signature
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### Startup

The lockout and tag devices have been removed and the machine or equipment has been re-energized. Note: The removal of some forms of blocking may require re-energization of the machine before safe removal.

Date	Time	Print Name	Signature
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### Notification

All affected employees have been notified that the servicing or maintenance is completed and the machine or equipment is ready for use.

Date	Time	Print Name	Signature
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EXAMPLE TAG

