

Palm Beach State College

Florida's First Public Community College



**ENERGY CONTROL PROGRAM
(LOCKOUT/TAGOUT)**

PALM BEACH STATE COLLEGE ENERGY CONTROL PROGRAM (LOCKOUT/TAGOUT)

1. PURPOSE

The purpose of the Palm Beach State College Energy Control program is to establish a safe means of isolating machinery, equipment and systems to prevent their accidental starting or energization, or the release of stored energy, that could cause injury to employees while repairs, cleaning or servicing are being performed. Additional objectives of the program include:

- Prohibit unauthorized personnel or remote control systems from starting machinery or equipment while it is being serviced (lockout).
- Provide a secondary control system (tagout) when it is impossible to positively lock out the machinery or equipment.
- Establish responsibility for implementing and controlling lockout/tagout procedures.
- Ensure that only approved locks and standardized tags provided by the College will be utilized in the lockout/tagout procedures.

2. DEFINITIONS

Authorized employee – A person who locks out or tags out a machine or item of equipment in order to perform servicing or maintenance on that item. An affected employee (see below) becomes an authorized employee when that employee's duties include performing servicing or maintenance covered under this section.

Affected employee – An employee whose job requires him/her to operate or use a machine or item of 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.

Other employee – An employee who may be in the work area where lockout/tagout procedures have been implemented. Although other employees do not service, maintain or repair machinery or equipment, they need to recognize when lockout/tagout procedures have been implemented and know that they are not to attempt operation or energization.

3. RESPONSIBILITIES

- The Safety & Risk Manager is responsible for developing the energy control program.
- The District Supervisor and Facilities Managers are responsible for enforcing the program and ensuring compliance with lockout/tagout procedures in their respective organizations.

- Authorized employees are responsible for following the established lockout/tagout procedures.
- Affected and other employees are responsible for leaving alone machinery and equipment on which lockout/tagout has been implemented.

4. PROCEDURES

Applicability

The procedures for energy control (lockout/tagout) apply during the servicing and maintenance of machines or equipment in which their unexpected energization or start-up, or release of stored energy, could cause injury to employees. Although the Occupational Safety and Health Administration's (OSHA's) regulations governing the establishment of energy control programs allow for servicing and maintenance activities to be performed on machines or equipment during "normal production operations" (defined as the utilization of a machine or equipment to perform its intended production function) without having to conduct lockout/tagout procedures provided certain risks are not present, the College does not engage in "production" activities per se, and all its machines or equipment, with the exception noted below, would be subject to lockout/tagout requirements whenever undergoing servicing or maintenance.

A written procedure for lockout/tagout does not have to be developed if the machine has only one energy source that is easy to identify, that completely shuts down the unit when shut off, that can easily be locked out during repairs and for which there is no potential for stored energy. A written procedure for lockout/tagout must be established for all other machines or pieces of equipment. If the machines are similar (such as those using the same magnitude and type of energy) and they have the same or similar types of controls and can be locked or tagged out using the same procedural steps, a single procedure covering them can be used. The procedure that will be generally used at Palm Beach State College is shown in Attachment A.

Exceptions

The lockout/tagout procedures described below do not apply at the College to servicing and maintenance of cord- or plug-connected electric equipment for which exposure to the hazards of unexpected energization or start-up is controlled by unplugging the equipment from the energy source and by the plug end being under the exclusive control of the employee performing the work at all times. Similarly, these lockout/tagout procedures do not apply when a single switch controls a single energy source for operation of the machine or item of equipment, which is completely de-energized when this switch is in the "off" position, and which is under the observation and control of the authorized employee at all times while servicing and maintenance is being performed. If the authorized employee relinquishes observation and control of this switch (e.g., leaves the work area for any length of time), lockout/tagout devices must be employed to ensure that this switch is not activated while the employee is absent.

Locks and Tags

A lockout device provides protection by preventing accidental startup or unexpected re-energization of a machine or item of equipment during servicing or maintenance by locking the energy-isolating device so that the machine or item of equipment cannot be activated or utilized. Locks shall be the preferred means of energy control during servicing or maintenance activities if the energy-isolating device is capable of being locked out. There shall be only one key for each lock which is controlled by the worker placing the lock. Each worker involved in the servicing or maintenance activity shall install their own lock. Master keys shall be under supervisory control, and their use shall be reserved for unusual circumstances, such as when the worker applying the lock is absent from the workplace. The procedures for removal of a lock in this situation are described below.

If the energy-isolating device is not capable of being locked out, a tag must be affixed to it to identify it as a source of potential danger and to warn against operating the machine or item of equipment. When tags are used in lieu of locks on an energy-isolating device that is capable of being locked out, the tagout device shall be attached at the same location that the lockout device would have been attached. Because tags do not provide the physical restraint of locks, they must be supplemented to provide a safety level equivalent to that afforded by using lockout. This will be accomplished through additional training and more rigorous periodic inspections (see below), as well as implementation of additional safety measures such as removing and isolating a circuit element, blocking a controlling switch, opening an extra disconnecting device or removing a valve handle to reduce the potential for any inadvertent energization while the tag is attached.

Only locks and tags designated for use as lockout/tagout devices may be used for controlling hazardous energy. The devices shall not be used for other purposes and must meet the following requirements:

Durable – The devices shall withstand the environment to which they are exposed for the maximum duration of the expected exposure. Tagout devices shall be constructed and printed so that they do not deteriorate or become illegible, especially in corrosive or wet environments.

Standardized – Lockout/tagout devices shall be standardized according to color, shape or size. Tagout devices shall be standardized according to print and format.

Substantial – Lockout devices shall be substantial enough to prevent removal except by the use of excessive force or unusual techniques, such as 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, and the means of attachment must be non-reusable, attachable by hand, self-locking and non-releasable, with a minimum unlocking strength of no less than 50 pounds, such as may be afforded by a one-piece nylon cable tie.

Identifiable – Locks and tags shall clearly identify the employee who applies them. Tags shall warn of hazardous conditions if the machine or item of equipment is energized and include a warning such as: DO NOT START, DO NOT OPEN, DO NOT CLOSE, DO NOT ENERGIZE or DO NOT OPERATE.

Only those locks and standardized tags provided by the College will be utilized in the lockout/tagout procedures.

Preparation for Lockout or Tagout

Employees who are authorized to utilize lockout/tagout procedures must be knowledgeable of the different energy sources and the proper sequence for shutting off and disconnecting them.

The three types of energy sources are:

- Electrical (most common form)
- Hydraulic or pneumatic (fluids, gases, steam)
- Mechanical (gravity activation or stored in springs, etc.)

More than one energy source can be utilized on some equipment and the proper procedure must be followed in order to identify energy sources and perform lockout/tagout accordingly.

Sequence of Lockout/Tagout Procedures

The general sequence for application of lockout/tagout is as follows:

Step 1: Prepare. Ensure that you have the appropriate number of locks and tags and that the keys are under your control. Review the lockout/tagout procedure.

Step 2: Determine the energy source. Identify the type and magnitude of energy sources that the machine or item of equipment uses, e.g., through reference to the item's operating manual, department procedures or supervisor. Make sure you know the methods to control the energy.

Step 3: Notify employees. Inform all affected employees that service or maintenance is required on the (identify the machine or item of equipment) and that it will be shut down and locked out to perform the work. Inform them of the estimated start and duration time.

Step 4: Shut down and isolate equipment. If the machine or item of equipment is operating, shut it down by the normal stopping procedure. Place all switches or valves in the "off" or "safe" position. Physically disconnect all sources of power from the circuit, ensuring that all sources of both the primary and secondary power to the equipment are interrupted.

- For electrical equipment, the disconnecting means may include the power cord, power panels (look for primary and secondary voltage), breakers, the operator's station, relays, limit switches and electrical interlocks. Some equipment may have a motor isolating shut-off and a control isolating shut-off.
- For hydraulically/pneumatically operated equipment, shut off all energy sources (pumps and compressors). If the pumps and compressors supply energy to more than one piece of equipment, lock out or tag out the valve supplying energy to this piece of equipment. Close valve(s) to block fluid/gas flow or by capping or blanking the lines (lines can be blanked by inserting a solid plate between the flanges of a joint) and lock out/tag out. Some systems may have electrically controlled valves. If so, they must be shut off, locked and/or tagged out. Some systems have replenishment devices, i.e., air compressors; they need to be shut off.
- For equipment powered by mechanical energy, block the moving part(s) against motion that might result from gravity (falling) or springs.

NOTE: Particular care must be taken to ensure that machines or items of equipment powered by multiple electrical circuits have had all circuit breakers opened. This is especially critical when working in junction boxes, which typically contain multiple circuits. In addition to opening all circuit breakers, a properly working circuit tester (employees should test it on a known live circuit before use) must be used to confirm that there are no live circuits before proceeding to work on the equipment.

Step 5: Dissipate residual/stored energy. Shutting down equipment does not mean that it is safe to work on. Check for and confirm the release and/or restraint of all stored or residual energy (e.g., in capacitors, hydraulic accumulators, air reservoirs, springs, elevated parts and air, gas, steam or water pressure, etc.)

- Drain capacitors to zero energy state by grounding.
- Vent fluids from pressure vessels, tanks or accumulators until the internal pressure is at atmospheric level.
- Drain or bleed hydraulic/pneumatic or fluid/gas lines to zero energy state.
- Release or block springs that are under tension or compression.
- Dissipate inertial forces by allowing the system to come to a complete stop after the machine or item of equipment has been shut down and isolated from its energy source(s).

Step 6: Lock out or tag out all in-line points of control. Install lockout or tagout device(s) on all energy-isolating devices identified in Step 4. Lockout devices, where used, shall be affixed in a manner to hold the energy-isolating device in a “safe” or “off” position. Tagout devices, where used, shall be affixed in a manner that will clearly indicate that the operation or movement of the energy-isolating device from the “safe” or “off” position is prohibited.

Step 7: Check the area. Ensure that no one is working on or in the machine or item of equipment and that all are clear.

Step 8: Verify lockout. Ensure that the system being worked on is the same one that has been locked out and verify that the machine or item of equipment is fully isolated from all energy sources by activating the normal operating control(s) (the “on/off” switch) to ensure that it will not operate.

Step 9: Return the control(s) to the safest position. Return the operating control(s) activated during the lockout verification in Step 8 to the “off” or neutral position.

Step 10: The machine or item of equipment is now locked out.

Step 11: Perform the maintenance or servicing. Ensure that the work performed does not bypass the lockout and reactivate the system. All locks and tags are to be left in place until the work is completely finished. Every person working on the system must place their own lock on the system; each person will remove their lock when they have finished their part of the job. A lock or tag is never to be removed except by the person who placed it there.

Release from Lockout/Tagout

When the service or maintenance is completed and the machine or item of equipment is ready to return to normal operating condition, the following steps shall be taken:

Step 1: Inspection. Make certain that the work is completed and that the machinery or equipment components are operationally intact. The tools and equipment that were used are to be inventoried and removed.

Step 2: Clean up. Remove all towels, rags, work-aids, etc.

Step 3: Replace guards. Sometimes a particular guard may have to be left off until the start sequence is completed due to possible adjustments. However, all other guards should be put back into place. After final check out, all guards should be in place.

Step 4: Check work area for employee safety. The work area shall be checked to ensure that all employees have been safely positioned or removed and notified that the lockout/tagout devices are being removed.

Step 5: Check controls. Verify that all controls are in a safe (“off”) or neutral position.

Step 6: Remove locks/tags. Remove only your lock or tag.

Step 7: Re-energize the machine or item of equipment. *Note:* The removal of some forms of blocking may require re-energizing of the machine or item of equipment before safe removal of the locking devices. Use extra caution.

Step 8: Notify affected employees. Let personnel in the area know that the service or maintenance is completed and that the machine or item of equipment is ready for use.

Procedure Involving More than One Person

When servicing and/or maintenance are performed by more than one person, each authorized employee shall place their own lock on the energy-isolating source and remove same when they stop working on the machine or item of equipment being serviced or maintained. This should be done by utilizing a group lockout device, such as a multiple lock scissors clamp or a group lockbox, if the equipment is capable of being locked out. Primary responsibility is vested in an authorized employee for a set number of employees working under the protection of a group lockout device. If the equipment cannot be locked out, then each authorized employee must place their tag on the equipment and remove it when their work is completed.

Procedure for Removal of an Authorized Employee's Lockout/Tagout by the College

Each lockout/tagout device shall be removed only by the employee who applied it. If the authorized employee who applied the lockout device is not in the facility, the supervisor may remove the device under the following conditions:

1. The supervisor of the servicing or maintenance activity will verify that the authorized employee who applied the device is not in the facility.
2. This supervisor will make reasonable efforts to advise the employee that his device has been removed. (This can be done when he/she returns to the facility).
3. This supervisor will ensure that the authorized employee has this knowledge before he/she resumes work at the facility.
4. The employee's immediate supervisor must also be notified of the lock removal when an attempt to inform an authorized employee is unsuccessful.

Procedures for Shift or Personnel Changes

Although infrequent, it may be necessary during the conduct of servicing or maintenance activities on a machine or item of equipment for more than one shift or a change of personnel to complete the work. In this situation, locks shall be transferred at the time of the shift or personnel change; i.e., the outgoing authorized employee shall remove their lock, and the incoming authorized employee shall replace it with their lock.

If the off-going authorized employee will leave before workers on the next shift will arrive, the off-going employee may apply a tagout device when they remove their lock. The tag would indicate that the machine or item of equipment is under lockout/tagout and that the machine or item of equipment is not to be re-energized. The in-coming authorized employee must verify that the system is still de-energized, then remove the interim tag and apply their lock. The supervisor(s) of the respective authorized employees are responsible for ensuring the continuity of lockout/tagout protection and the orderly transfer of the lockout/tagout protection devices between the employees.

Procedures for Outside Personnel/Contractors

Outside personnel/contractors shall be advised that the College has and enforces/requires the use of locks and tags in conjunction with lockout/tagout procedures. They will be informed that it is prohibited to restart or re-energize machines or equipment that have been locked out or tagged out by the College.

Outside personnel/contractors who must employ lockout/tagout procedures to perform their work on behalf of the College shall follow the procedures established for their own energy control programs.

5. EMPLOYEE TRAINING

Employees applying or affected by lockout/tagout procedures shall have initial and recurring training as required or necessary. Each authorized employee will be trained initially and annually thereafter in the recognition of applicable hazardous energy sources, the type and magnitude of the hazardous energy sources available in the work place and the methods and means necessary for isolation and control of those energy sources.

Affected and other employees shall receive initial training in recognition of when lockout/tagout procedures are being implemented in the workplace, the purpose and use of these procedures and the prohibition against start-up or use of any equipment that has been locked or tagged out.

Where tagout systems are used, all employees shall also be trained in the following limitations of tags:

- Tags are essentially warning devices affixed to energy-isolating means and do not provide the physical restraint on their movement that is afforded by a lock.
- When a tag is attached to an energy-isolating means, it is not to be removed except by the person attaching or with their authorization, and it is never to be bypassed or ignored.
- In order to be effective, tags must be legible and understandable by all employees who are or may be in the work area.
- Tags and their means of attachment must be made of materials which will withstand the environmental conditions encountered in the workplace.
- Tags must be securely attached to energy-isolating devices such that they cannot be inadvertently or accidentally detached during use.
- Tags may evoke a false sense of security, and their meaning needs to be understood as part of the overall energy control program.

Retraining shall be provided whenever there is a change in employee job assignments, a change in machines, equipment or processes that present a new hazard, or a change in the energy control procedures. Additional retraining of an authorized employee shall also be conducted whenever a periodic inspection indicates a deviation from or inadequacies in the employee's understanding or use of an energy control procedure.

All training will be documented and certified as shown in Attachment B. Documentation will be retained in the Safety & Risk Management office.

6. PERIODIC INSPECTIONS

A periodic inspection (at least annually) will be conducted of each energy control procedure by an authorized employee to ensure that the procedure continues to be implemented properly. The procedure that will be generally used at Palm Beach State College is shown in Attachment A. Energy control procedures that are used less than once a year may be inspected only when used. The periodic inspection must include a review between the inspector and each authorized employee of that employee's responsibilities under the lockout procedure. However, each authorized employee does not need to be observed performing the procedure as part of the inspection. Instead, for a group of employees the inspection may include a representative number of them actually performing the procedure while the others watch. An authorized employee other than the one(s) using the procedure must perform the periodic inspection.

When a tagout procedure is inspected, affected employees also have to be included in the review. A review on the limitation of tags, in addition to the above requirements, shall also be included.

Distinct procedures associated with similar machines or items of equipment may be grouped into a single procedure for the purpose of conducting periodic inspections.

The inspector will certify in writing that the inspection has been performed. The written certification, as shown in Attachment C, shall include:

- Identity of the machine or item of equipment on which the energy control procedure was used.
- Date of the inspection.
- Employees included in the inspection.
- Name of the person performing the inspection.

A copy of the periodic inspection certification shall be sent to the Safety & Risk Office for recordkeeping/retention until the next periodic inspection.

7. REFERENCES

Title 29, Code of Federal Regulations, Section 1910.147, "The control of hazardous energy (lockout/tagout)"

ATTACHMENT A

PALM BEACH STATE COLLEGE

LOCKOUT/TAGOUT PROCEDURE

APPLICABILITY: The requirements for lockout/tagout do not apply at the College to servicing and maintenance of cord- or plug-connected electric equipment for which exposure to the hazards of unexpected energization or start-up is controlled by unplugging the equipment from the energy source and by the plug end being under the exclusive control of the employee performing the work at all times.

Similarly, the requirements for lockout/tagout do not apply when a single switch controls a single energy source for operation of the machine or item of equipment, which is completely de-energized when this switch is in the “off” position, and which is under the observation and control of the authorized employee at all times while servicing and maintenance is being performed. If the authorized employee relinquishes observation and control of this switch (e.g., leaves the work area for any length of time), lockout/tagout devices must be employed to ensure that this switch is not activated while the employee is absent.

However, a written procedure for lockout/tagout does not have to be developed if the machine has only one energy source that is easy to identify, that completely shuts down the unit when shut off, that can easily be locked out during repairs and for which there is no potential for stored energy. Otherwise, the written lockout procedure established below shall be followed.

WRITTEN LOCKOUT PROCEDURE FOR: All machines or items of equipment powered by electricity, hydraulic or pneumatic energy (e.g., fluids, gases or steam) or mechanical energy (e.g., gravity activation or stored in springs), which shall be required when none of the exceptions noted above apply.

PURPOSE: This procedure establishes the minimum requirements for the lockout of energy-isolating devices whenever servicing or maintenance is performed on the machine(s) or item(s) of equipment for which a written lockout procedure is required. It shall be used to ensure that the machine or equipment is stopped, isolated from all potentially hazardous energy sources and locked out before authorized employees perform any servicing or maintenance where the unexpected energization or start-up of the machine or item of equipment, or release of stored energy from it, could cause injury.

COMPLIANCE: All employees are required to comply with the restrictions and limitations imposed upon them during the use of lockout. Lockout shall be performed in accordance with this procedure only by authorized employees. All employees, upon observing a machine or item of equipment that is locked out to perform servicing or maintenance, shall not attempt to start, energize or use that machine or item of equipment. Employees failing to observe the lockout/tagout procedures may be subject to disciplinary action in accordance with College policies.

SEQUENCE OF LOCKOUT:

Step 1: Verbally notify all affected employees (those whose job requires use of a machine or item of equipment being locked or tagged out or who may be in or near the immediate work area) that servicing or maintenance is required on the machine or item of equipment and that it will be shut down and locked out to perform the work. Affected employees could include any other Facilities employees who are working or happen to be in the area, as well as the area's normal occupants.

Step 2: Identify the type and magnitude of energy source(s) that the above-named machine or item of equipment uses through reference to its operating manual, PM procedure, etc. Ensure that you know the methods to control its energy.

Step 3: If operating, shut down the above-named machine or item of equipment by using the normal stopping procedure (i.e., depress its stop button, open its switch, close its valve, etc.).

Step 4: De-activate the energy-isolating device(s) for the machine or item of equipment by opening its circuit breaker(s), employing its disconnect switch(es), closing its line valve(s) or otherwise blocking the transmission or release of energy to it.

NOTE: Particular care must be taken to ensure that machines or items of equipment powered by multiple electrical circuits have had all circuit breakers opened. This is especially critical when working in junction boxes, which typically contain multiple circuits. In addition to opening all circuit breakers, a properly working circuit tester (employees should test it on a known live circuit before use) must be used to confirm that there are no live circuits before proceeding to work on the equipment.

Step 5: Apply the lock(s)—lock out the energy-isolating device(s) with assigned individual lock(s). Apply tags if appropriate.

Step 6: Dissipate or restrain all stored or residual energy (e.g., in capacitors, springs, elevated machine members, rotating flywheels, hydraulic systems and air, gas, steam or water pressure, etc.) by grounding, repositioning, blocking, bleeding down, etc.

Step 7: Check that no personnel are working on or in the machine or item of equipment and that all are clear.

Step 8: Verify that the machine or item of equipment is isolated (disconnected) from its energy source(s) by operating the normal operating control(s) to ensure that it will not operate (or is at a zero energy state); i.e., turn it on to see if it operates.

Step 9: Return the operating control(s) activated during the isolation verification in Step 8 to the “off” or neutral position if the machine or item of equipment does not respond. Otherwise, retrace the previous steps and repeat them until it no longer responds when turned on.

Step 10: The machine or item of equipment is now locked out.

RESTORING THE MACHINE OR ITEM OF EQUIPMENT TO SERVICE:

When the service or maintenance is completed and the machine or item of equipment is ready to return to normal operating condition, the following steps shall be taken:

Step 1: Ensure that the work is completed and that the machinery or equipment components are operationally intact. The tools and equipment that were used are to be inventoried and removed.

Step 2: Remove all towels, rags, work-aids, trash, etc.

Step 3: Replace guards as necessary. Sometimes a particular guard may have to be left off until the start sequence is completed due to possible adjustments. However, all other guards should be put back into place. After final check out, all guards should be in place.

Step 4: Check the work area to ensure that all employees have been safely positioned or removed.

Step 5: Verify that all controls are in a safe (“off”) or neutral position.

Step 6: Remove locks/tags. Remove only your lock or tag.

Step 7: Re-energize the machine or item of equipment. *Note:* The removal of some forms of blocking may require re-energizing of the machine or item of equipment before safe removal of the locking devices. Use extra caution.

Step 8: Notify affected employees that the service or maintenance is completed and that the machine or item of equipment is ready for use.

**ATTACHMENT B
PALM BEACH STATE COLLEGE
SAFETY TRAINING SIGN-IN SHEET**

Course Name: LOCKOUT/TAGOUT PROGRAM	Date/Time:
Instructor:	Campus:

Printed Name	Campus	Job Classification	Signature
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			

CERTIFICATION OF TRAINING: Training has been accomplished and is being kept up-to-date. _____ (Signature/Date)

**ATTACHMENT C
PALM BEACH STATE COLLEGE
LOCKOUT/TAGOUT
PERIODIC INSPECTION CERTIFICATION**

I certify that the following authorized employees of Palm Beach State College were inspected on the date shown below utilizing Palm Beach State College's lockout/tagout procedure:

Names of Employees

Printed Name	Signature
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

Name of machine or equipment used: _____

Date: _____

Name of Inspector: _____

Certification of Inspection: _____
(Signature of Inspector)

**SEND THIS PERIODIC INSPECTION CERTIFICATION TO THE
SAFETY & RISK OFFICE UPON COMPLETION.**