

LOCKOUT / TAGOUT GUIDELINES

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AN ELECTRICAL SAFE WORK CONDITION

All of the following steps shall be taken in order to reach an electrically safe work condition:

- 1) Identify all sources of power.
- 2) Turn off the sources of power and apply locks and tags.
- 3) Verify the circuit is de-energized using a solenoid type tester if the nominal voltages are 480V or less.
- 4) A CAT IV multi-meter shall be used to test circuits with nominal voltages in excess of 480V.

If any of the above steps are not performed the circuit shall be considered to be energized and the work shall be performed in accordance with the Energized Work Policy.

The Following Are Excerpts Taken Directly from the Standard for Electrical Safety in the Workplace (NFPA 70E, 2009)

PRINCIPALS OF LOCKOUT/TAGOUT EXECUTION

- **Employee Involvement.** Each person who could be exposed directly or indirectly to a source of electrical energy shall be involved in the lockout/tagout process.
- **Training.** All persons who could be exposed shall be trained to understand the established procedure to control the energy and their responsibility in executing the procedure. New (or reassigned) employees shall be trained (or retrained) to understand the lockout/tagout procedure as related to their new assignment.
- **Plan.** A plan shall be developed on the basis of the existing electrical equipment and system and shall utilize up-to-date diagrammatic drawing representation(s).
- **Control of Energy.** All sources of electrical energy shall be controlled in such a way as to minimize employee exposure to electrical hazards.
- **Identification.** The lockout/tagout device shall be unique and readily identifiable as a lockout/tagout device.
- **Voltage.** Voltage shall be removed, and the absence of voltage verified.
- **Coordination.** The established electrical lockout/tagout procedure shall be coordinated with all of E Light Electric Services' procedures associated with lockout/tagout of other energy sources.

RESPONSIBILITY

Procedures

E Light Electric Services shall establish lockout/tagout procedures for the organization, provide training to employees, provide equipment necessary to execute the details of the procedure, audit execution of the procedures to ensure employee understanding/compliance, and audit the procedure for improvement opportunity and completeness.

Form of Control

Three forms of hazardous electrical energy control shall be permitted: individual employee control, simple lockout/tagout, and complex lockout/tagout. For the individual employee control and the simple lockout/tagout, the qualified person shall be in charge. For the complex lockout/tagout, the person in charge shall have overall responsibility.

Audit Procedures

An audit shall be conducted at least annually by a qualified person and shall cover at least one lockout/tagout in progress and the procedure detail. The audit shall be designed to correct deficiencies in the procedure or in employee understanding.

Complex Lockout/Tagout.

All jobsites shall use a simple lockout procedure involving one lock per person and shall be controlled by the individual who is performing the work. All employees involved in the work and exposed to potential hazard shall place their lock on the power source and only they may remove their lock. Any other form of lockout/tagout must be reviewed and approved as detailed in this policy.

Personal Locks

E Light Electric Services shall provide a single lock to each employee involved in field work and a single key to that lock. Each lock assigned shall be uniquely keyed. This lock shall be the responsibility of the employee and must be in their possession or control while working on a jobsite at all times. The employee will be responsible for replacement of their lock if it is lost or otherwise rendered inoperable. E Light Electric Services shall not keep copies of locks or keys. All personnel are responsible for removing their personal locks at the end of each work shift and placing their locks in place at the beginning of each work shift or when necessary.

All employees are responsible for accomplishing the steps of an electrically safe work condition. Each employee is responsible of determining the source of power, assuring circuits are de-energized, applying their personal lock to the control sources and testing for themselves to verify that a circuit is de-energized before any work may be performed.

Continuity and Supervisory Locks

Superintendents may place a lock on a power source to ensure it stays locked out for an extended period of time for control purposes. This lock is not a lockout/tagout lock.

and any person working on circuitry associated with the power source shall be required to place a personal lock on the power source in addition to the continuity lock. Failure to comply with this policy may result in disciplinary action including suspension, reduction in pay or termination.

SIMPLE LOCKOUT/TAGOUT PROCEDURE

All lockout/tagout procedures that are not under individual qualified employee control according to 120.2(D)(1) or complex lockout/tagout according to 120.2(D)(3) shall be considered to be simple lockout/tagout procedures. All lockout/tagout procedures that involve only a qualified person(s) de-energizing one set of conductors or circuit part source for the sole purpose of performing work within the Limited Approach Boundary electrical equipment shall be considered to be a simple lockout/tagout. Simple lockout/tagout plans shall not be required to be written for each application. Each worker shall be responsible for his or her own lockout/tagout.

Complex lockout/tagout procedures shall be permitted but only after careful planning and approval of the Director Education and Loss Prevention, The Project Manager, and the Site Superintendent. Refer to NFPA 70E (2009) for further details. Anytime that complex lockout/tagout procedures are used on a construction project, the superintendent shall be personally responsible for the lockout/tagout procedure and shall be personally responsible for ensuring the safety of all personnel affected by the lockout/tagout procedure.

COMPLEX LOCKOUT/ TAGOUT PROCEDURE GUIDELINES

E Light Electric Service employees must establish a written program to ensure the control of electrical energy, which has been de-energized for the purpose of maintenance, repair, and/or modification on each jobsite and project unless a simple lockout/tagout procedure is to be used. Materials referenced herein are gathered from applicable standards, including 29 CFR 1926.416, 29 CFR 1910.333(b)(2), 29 CFR 1910.333(c)(2) and 29 CFR 1926.333(c)(10), NFPA 70E. While OSHA requires these procedures for the hazard of electricity, and any of the following hazards, it is advisable to get the machine to zero mechanical state:

- Water pressure in excess of 30 PSI.
- Hot water in excess of 120°.
- Fuel gases (in pipelines or cylinders).
- Compressed air in excess of 30 PSI.
- Hydraulics in excess of 30 PSI.
- Mechanical (stored residual energy).

The following sections contain guideline information for developing a complex lockout/Tagout procedure when a simple lockout/tagout procedure is not to be used. The complex lockout/tagout program must be submitted in writing for review and approval of the Director of Education and Loss Prevention.

PURPOSE

To establish a program and utilize procedures for affixing appropriate Lockout or Tag out devices to energy isolating devices. To otherwise disable any potentially dangerous energy, machines, or equipment to prevent unexpected energization, start up or release of stored energy in order to prevent injury before employees perform any maintenance, repair, or modification activities where stored energy could create injury.

NOTE: in some cases, this is used to keep persons from turning off items that could create hazards, such as, but not limited to: life support, emergency services, FAA controls, etc.

ENERGY HAZARDS

- Any electrical charge in excess of 3 Milli-amps (Ma) is capable of causing a painful shock, which, in turn can cause indirect accidents.
- Any electrical charge in excess of 10 Ma can cause muscle contractions: the "NO-LET-GO" danger.
- A shock of more than 30 Ma can result in lung paralysis. This is usually temporary but may require CPR.
- A "jolt" of more than 50 Ma can lead to possible ventricular fibrillation (heart dysfunction which is usually fatal).
- A shock of 100 Ma to 4 amps will usually result in certain ventricular fibrillation and is usually fatal.

Note: Above scenarios are based upon AC current at 60 cycles/second.

RESPONSIBILITIES

Supervisors shall instruct all employees in the safety, significance, purpose, and use of the Lockout and/or Tagout procedure every twelve months and maintain a record thereof. Each new or transferred employee shall be instructed immediately upon assignment where this procedure may become a factor to the employee's safety.

Training records for all employees shall be delivered to the safety department for filing in each employee's personal file.

AUTHORITY

The Supervisor shall be in charge of the operation of the lockout and/or tagout system.

Employees who are assigned by the Supervisor shall be authorized to operate the system with the Supervisor's approval.

OUTSIDE CONTRACTORS AND/OR VENDORS

Must submit their written lockout/tagout system to the Director of Education and Loss Prevention for approval.

Use of this plan must be coordinated the general contractor, owner, subcontractor and all employees to the extent that all involved employees are fully aware of the system.

PREPARATION FOR LOCKOUT AND/OR TAGOUT

- **The Supervisor assigned to the task to be performed must:**
 - Make a survey to locate and identify all energy isolating devices to be certain which switches or other devices apply to the machinery, equipment, or energized circuit to be locked out/tagged out. More than one energy source may be involved.
 - Utilize NFPA 70E to determine hazards, procedures and personal protective equipment which may be required.
 - Create a file with the written record of this survey, which should include the date, worksite, locations and types of switches/devices, and the people who made the survey.

- **Energy isolating means:**

Cord and plug connection equipment: Unplug and control the plug (cord-cap).

Open switches and/or devices: Apply a tag, and/or personal padlock plus a **"DANGER - LOCKOUT TAG"** which is signed, dated, and secured by each person working on the isolated device. If more than one person is involved, use a "Multi-Lock" hasp. (or)

In equipment rooms such as but not limited to electrical rooms, elevator rooms and alike, where the area is controlled by qualified persons, only the following may be used:

- The door to the room can be controlled with limited access keys and can be kept locked or secured to only qualified persons. Signs should also be posted, and each panel should be locked and have a panel schedule with individual's names next to them who will be working on that circuit. Only the supervisor will be able to close (activate) a breaker or control.
- Anyone found not following this policy will be subject to termination.

SEQUENCE OF LOCKOUT AND/OR TAGOUT SYSTEM PROCEDURE

1. The Supervisor in charge of the operation shall notify all affected employees that a Lockout and/or Tagout system is going to be utilized and the reason(s) therefore. The assigned employee(s) shall be instructed as to the type and magnitude of energy that is involved in the operation and shall understand the hazards thereof and be given a copy of the pre-job survey record as described in G (1)(a and b) above. It should be noted that whenever possible both locks and tags are to be used.
2. If the machine, equipment, or energized circuit is in operation, it shall be shut down by the normal stopping procedure.
3. The authorized assigned employee shall operate the switch or other energy isolating device(s) so that the equipment is isolated from its energy source(s).
4. Lockout and/or tagout the energy isolating devices using the assigned individual's locks and tags as described in G (2)(b).
5. The assigned employee(s), after ensuring that no personnel are exposed, and disconnecting the energy sources, shall operate the normal operating control(s) to make certain the machinery, equipment, or energized circuit will not operate. After the test, the employee(s) shall return the operating control(s) to the "neutral" or "off" position.
6. If the equipment did not operate during the test procedure outlined in H (5), it is now locked and/or tagged out and the assigned work can begin. (Note: If the disconnect is in site and is not more than 25 ft. from work, and the area will not be left unattended, no lockout or tagout is needed. IN-SITE!)

RESTORING MACHINERY, EQUIPMENT, OR ENERGIZED CIRCUIT TO NORMAL OPERATIONS

- After assigned work is completed and the machinery, equipment, or energized circuit is ready to return to normal operations, the assigned employee(s) shall check the area around the machine or equipment to ensure that no one is exposed.
- The employee(s) shall remove all tools from the machine or equipment, reinstall all guards, recheck for absence of other people, and then remove all Lockout and/or Tagout devices and/or tags.
- The supervisor shall inspect the equipment and terminations to ensure that all tools and material have been removed, all terminations are complete and made correctly and all safeguards are in place.
- The employee(s) will then operate the energy isolating device(s) to restore energy to the machinery, equipment, or energized circuit. Refer to NFPA 70E to determine the level of PPE required to re-energize the equipment or circuitry.

Only an authorized journeyman wireman may energize a circuit.

PROCEDURE INVOLVING MORE THAN ONE PERSON

- Each and every person required working under conditions requiring Lockout and/or Tagout procedures shall place his/her own personal lock and signed, dated tag on the energy isolating device(s).
- When an energy-isolating device cannot accept multiple locks and tags, a multiple lock hasp shall be used.
- As each person completes his/her task(s), he/she shall remove his/her assigned lock and/or tag and return them to the Supervisor.
- The last employee(s) to finish will restore the machine to normal operations following procedures as indicated in section I above.

LOCKOUT AND/OR TAGOUT EQUIPMENT

- The Supervisor shall keep a set of special, uncommon padlocks reserved for lockout service and a supply of tags which shall indicate **"DANGER - THIS TAG AND LOCK TO BE REMOVED ONLY BY PERSON SHOWN ON THIS TAG"**.
- All lockout locks shall be keyed differently and no copies of keys shall be made. Each lock issued shall be issued with only one key.
- The Supervisor shall maintain a log of issuance and return of all locks by date of issue, control number or color, to whom it was issued, and the date of return if a lock out system other than a simple lock out procedure is utilized.
- When an employee returns a lock, he/she should also return the appropriate tag from the same device.
- Once a lock has been issued, it is not transferable to another employee until it has been returned to the Supervisor.
- If, at the end of a shift, the assigned task has not been completed, and there will be no intervening shift of workers, the original Lockout and/or Tagout devices and/or tags shall remain in place.
- If there is to be a shift change and work continues, the oncoming shift employee(s) will secure their own locks and tags and the off-going shift employee(s) shall remove theirs.

BASIC RULES FOR THE USE OF LOCKOUT AND/OR TAG OUT PROCEDURES

- All equipment shall be locked and tagged out to protect against accidental or inadvertent operation when such operation could cause injury to personnel.



- No one shall attempt to operate any switch or other energy-isolating device when it is locked and/or tagged out.
- Any unauthorized person found tampering with, or removing, Lockout and/or Tagout equipment will be subject to disciplinary action.

FORMS

CFR29-1910.333(b)(2) requires documentation of the Contractor's efforts to effectively operate a Lockout and/or Tagout program. The following forms are offered as examples for fulfilling this operation.

- Training Documentation
- Determination of Lockout or Tagout
- Inspection
- Periodic Inspection
- Location of Lockouts - Machine/Area Specific
- Lockout Sequence Checklist
- Group Lockout and/or Tagout Procedure
- Restoring Machines or Equipment to Normal Operations

LOCKOUT AND/OR TAGOUT GUIDELINES DETERMINATION FOR LOCKOUT AND/OR TAGOUT

This is a preliminary survey form used to determine the need to document Lockout and/or Tagout procedures for a machine or equipment.

SPECIFY THE MACHINE, EQUIPMENT, OR ENERGIZED CIRCUIT: _____

DO THE FOLLOWING CONDITIONS EXIST?	YES	NO
The machine, equipment, or energized circuit has no potential for stored or residual energy or re-accumulation of stored energy after shutdown which could endanger employees		
The machine, equipment, or energized circuit has a single energy source which can be readily identified and isolated		
The isolation and locking out of that energy source will completely de-energize and deactivate the machine, equipment, or energized circuit		
The machine, equipment, or energized circuit is isolated from that energy source and locked out during servicing, maintenance, and/or modification		
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, maintenance, and/or modification		
The servicing, maintenance, and/or modification does not create hazards for other employees		
No accidents involving the unexpected activation or re-energization of the machine, equipment, or energized circuit during servicing, maintenance, and/or modification have occurred on this machine or equipment		

If **"yes"** was indicated on **ALL of the above points**, the required procedure for the particular machine, equipment, or energized circuit **need not be documented**. Otherwise, lockout and/or Tag out procedure includes the steps outlined in the **PROCEDURES** section as follows.



**LOCKOUT AND/OR TAGOUT GUIDELINES
PERIODIC INSPECTION**

DATE: _____

This form is to be completed each time a Lockout and/or Tagout operation is inspected in accordance with the requirements of the General Industry Standard 1910.333 standard and is to be filed in the Supervisor record of the inspection.

SPECIFY THE MACHINE, EQUIPMENT, OR ENERGIZED CIRCUIT:

AUTHORIZED EMPLOYEE IN CHARGE OF THE OPERATION BEING INSPECTED:

AUTHORIZED EMPLOYEE(S) PERFORMING THE INSPECTION:

For Construction Industry 29CFR1926.417 - Specify the Room, equipment, panel or energized circuit: (per Floor)

- Inspector reviewed with the **AUTHORIZED** employee the employee's responsibilities and knowledge of the lockout procedure and use. No deficiencies. **Check: YES NO**
- Inspector reviewed with the **AUTHORIZED & AFFECTED** employees, each Employee's responsibilities and the limitations of tags. No deficiencies. **Check: YES NO**
- Deficiencies found requiring correction/re-training: **Check: YES NO**

Employees performing the work inspected:

NAME

JOB TITLE



LOCKOUT AND/OR TAGOUT GUIDELINES
LOCATION OF LOCKOUTS - MACHINE/AREA SPECIFIC

This form must be completed for each machine or equipment for which Lockout and/or Tagout procedures are required to be documented.

MACHINE/EQUIPMENT	TYPE & I.D.	NUMBER:
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DEPARTMENT SUPERVISOR:

AUTHORIZED EMPLOYEE:



LOCKOUT AND/OR TAGOUT GUIDELINES

LOCKOUT SEQUENCE

This form is to be completed each time Lockout or Tag out is necessary during maintenance/servicing/modification of machines, equipment, or energized circuits. Post this form on or near the machine and initial each requirement as it is completed.

DESCRIPTION	INITIALS
Review the MACHINE SPECIFIC form on file to determine all types of energy involved and the location of each isolating device.	
Notify all AFFECTED employees that a lockout or Tagout system is going to be utilized and the reason it is necessary. The AUTHORIZED employee shall know the type and magnitude of energy involved and shall understand the hazards before initiating lockout.	
I verify that as an AFFECTED employee or Supervisor, I have been notified that a lockout or Tagout procedure will be utilized on this equipment. I understand that only the AUTHORIZED employee can remove the lockout and restore the equipment to normal operation.	
If the machine or equipment is operating, shut it down using normal procedure (stop button, toggle switch, etc.).	
Use energy isolating devices such as switches, valves, etc. to isolate the machine/equipment/circuit from ALL energy sources. Dissipate or restrain stored energy such as in springs, rotating flywheels, hydraulic systems, air, gas, waterlines, etc.	
Lockout and/or Tagout the energy isolating devices using assigned locks/tags. All locks/tags must be identified with the name of the individual applying the device.	
Before beginning the maintenance/service/modification work, make sure that all employees are clear of the area and operate the normal starting/operating controls to make certain that the equipment has been made incapable of startup. Be sure to return the controls to the "OFF" position after the test.	

***** AFTER MAINTENANCE/SERVICING/MODIFICATION IS COMPLETE *****

Refer to the procedure sequence for Restoring Machines, Equipment, or Circuit to Normal Operations.

LOCKOUT AND/OR TAGOUT GUIDELINES RESTORING MACHINES OR EQUIPMENT TO NORMAL OPERATIONS

The following steps are to be taken when service, maintenance, and/or modification operations are completed.

The **AUTHORIZED** employee is to initial each step as it is completed:

ACTIVITY	INITIALS
After servicing, maintenance, and/or modification are complete, inspect the area to see that all non-essential items have been removed, and that the machine, equipment, or circuit components are operationally intact.	
After the machine, equipment, or circuit is ready for normal operation; check the area around the machines and equipment to ensure that no one is exposed.	
After all tools have been removed from the machines, equipment, and areas, guards have been re-installed, and employees are in the clear, remove all lockout and/or tagout devices. Disengage the energy-isolating devices to restore energy to the machine, equipment, or circuit.	(CHECK-BY)
Notify AFFECTED employees that the service is complete and have them remove their locks from the energy source	

The Supervisor needs to ensure the area is safe for the energy to be established, this can be done by; physically checking the area, taking inventory of people, tools, and equipment before activation, by physically talking to each individual, and by checking and ensuring each employee has removed the locks and/or tag system, and/or signed out.

When the Supervisor in charge is sure the area is safe for activation then the energy may be restored.