

MCAA

Mechanical Contractors Association of America

Model Lockout/Tagout Program for Electrical Safety (Based on NFPA 70E-2021)



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Model Lockout/Tagout Program (NFPA 70E)

Introduction

The *National Fire Protection Association (NFPA)* develops codes and standards, including the National Electrical Codes. NFPA 70 refers to the National Electrical Codes. NFPA 70E, which is part of the National Electrical Codes, is the national standard for electrical safety in the workplace. The standard is on a three (3) year revision cycle. The most current version of the standard is *NFPA 70E – 2021*.

Employers are required to establish a written lockout/tagout program, and when complex lockout/tagout is required, employers must establish a written complex lockout/tagout plan that is specific to each application.

This model lockout/tagout program on electrical safety for workers, which is based on the provisions found in *NFPA 70E – 2021*, includes a tailorable model complex lockout/tagout plan in its appendix.

This model program is not intended to provide exhaustive treatment about lockout/tagout for electrical safety, or electrical safety in the workplace in general as it pertains to mechanical service work. Further, it is not intended to provide legal advice. Employers must make independent determinations regarding the need for legal assistance.

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Instructions

This model program and the model complex lockout/tagout plan in the appendix are designed to be easily tailored for each company's specific needs. To tailor the program and/or plan, carefully follow these instructions. If you have any questions that are not answered in this publication, please contact MCAA at 800-556-3563.

Read the parts of NFPA 70E – 2021 that pertain to lockout/tagout. Get all your questions answered before you start work on your company's lockout/tagout program.

1. Read the model program. Obvious areas that require your attention will be highlighted in yellow. However, it is critical that you:
 - | Fully understand the electrical hazards and lockout/tagout applications that your program needs to cover;
 - | Delete everything that does not apply to your company's specific applications; and
 - | Add whatever provisions are necessary to complete the lockout/tagout program.
2. Be sure to follow the highlighted prompts and delete the highlights.
3. Be sure to personalize the program by including your company logo on the cover page.
4. Implement your company's Lockout/Tagout Program for Electrical Safety in the Workplace.

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Company Name

**Lockout/Tagout Program for
Electrical Safety in the Workplace**

Model Lockout/Tagout Program (NFPA 70E)

Overview

Whenever applicable, lockout/tagout will be used to control (key in your company's name) worker exposure to electrical energy hazards. All affected company workers and supervisors are required to comply with the lockout/tagout principles and procedures established by this program.

Purpose

The purpose of this program is to establish the minimum (key in your company's name) requirements for lockout/tagout of electrical energy sources. It is to be used to ensure that electrical conductors and circuit parts are disconnected from sources of electrical energy, locked and/or tagged, and tested before work begins wherever workers could be exposed to electrical hazards. And it is to ensure that sources of controlled energy, such as capacitors or springs, are relieved of their energy, and a mechanism is engaged to prevent the re-accumulation of energy.

Responsibility

(Key in the name of the person with overall responsibility) will ensure that:

- | All affected workers are instructed in the significance of the lockout/tagout procedure with specific regard to worker safety;
- | All new or transferred workers, and all others whose work operations are or may be in the area, receive instruction in the purpose and use of the lockout/tagout procedure;
- | All affected workers receive appropriate instruction on their roles and responsibilities; and
- | All workers who are installing a lockout/tagout device know that they are responsible for signing their names and writing the date on the tags.

Preparation for Lockout/Tagout

- | All applicable diagrammatic drawings (or their equivalent), tags, labels, and signs will be reviewed to identify and locate all disconnecting means so that it can be determined that power is interrupted by a physical break, and not merely deenergized by a circuit interlock.
- | A list of disconnecting means to be locked and/or tagged out will be established.
- | All applicable disconnecting means will be reviewed to determine the adequacy of their interrupting ability.
- | It will be determined whether a visible open point can be verified, or whether

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other protective measures will be necessary.

- | Other work activity will be reviewed to identify where and how other workers may be exposed to electrical hazards.
- | Other energy sources in the physical area will be reviewed to determine worker exposure to sources of other types of energy.
- | Energy control methods for other hazardous energy sources in the area will be established where applicable.
- | An adequately rated test instrument will be provided to test each phase conductor or circuit part, and to verify that they are deenergized.
- | A method will be established to determine that the test instruments are operating properly.
- | Where the possibility of induced voltages or stored electrical energy exists, phase conductors or circuit parts will be grounded before they are touched.
- | Where contact with other exposed energized conductors or circuit parts is possible, ground connecting devices will be applied.

Simple Lockout/Tagout Procedure

- | Simple lockout/tagout will be used by (key in your company's name) workers only when the lockout/tagout procedures involve a qualified person deenergizing one set of conductors or circuit part source for the sole purpose of safeguarding workers from exposure to electrical hazards.
- | Simple lockout/tagout procedures will not be written for each application. However, each affected worker will be responsible for his or her own lockout/tagout, and the simple lockout/tagout procedure will involve each of the following:
 - | Purpose;
 - | Responsibility;
 - | Preparation for Lockout/Tagout;
 - | Sequence of Lockout/Tagout System Procedures;
 - | Restoring the Equipment, Electrical Supply, or Both to Normal Condition;
 - | Procedures Involving More Than One Person;
 - | Procedures Involving More Than One Shift;
 - | Complex Lockout/Tagout;
 - | Equipment;
 - | Review; and
 - | Lockout/Tagout Training.

Sequence of Lockout/Tagout System Procedures

- | All affected employees will be notified that a lockout/tagout system is going to be implemented, and they will be informed about the reason for it.
- | The qualified worker implementing the lockout/tagout will know the disconnecting means location for all sources of electrical energy, and the location of all sources of stored energy.
- | The qualified person will be knowledgeable about the hazards associated with electrical energy.
- | Whenever the electrical supply is energized, the qualified person will deenergize and disconnect the electrical supply and relieve all sources of stored energy, including capacitors.
- | Whenever possible, it will be visually verified that the blades of disconnecting devices are fully open, or draw-out type circuit breakers are withdrawn to a fully disconnected position.
- | All disconnecting means will be locked/tagged out with lockout/tagout devices.
- | When tagout alone is being performed, additional safety measures, such as opening, blocking, or removing an additional circuit element will be performed.
- | An attempt to operate the disconnecting means will be made to determine that operation is prohibited.
- | An appropriate test instrument will be used to ensure that the electrical supply has been deenergized/disconnected.
- | Prior to use, the test instrument will be inspected for damage.
- | Damaged test instruments will not be used. Work will stop until an appropriate, properly working test instrument is provided to ensure that the electrical supply has been deenergized/disconnected.
- | Proper test instrument operation will be verified on a known source of voltage prior to testing for absence of voltage.
- | Immediately after testing for absence of voltage, proper test instrument operation will be verified a second time on a known source of voltage.
- | Whenever it is required, a grounding equipment conductor device will be installed on the phase conductors or circuit parts to eliminate induced voltage or stored energy. Installation will be completed before phase conductors or circuit parts are touched.
- | Whenever contact with other exposed energized conductors or circuit parts is possible, ground connecting devices rated for the available fault duty will be applied.

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Restoring the Equipment, Electrical Supply, or Both to Normal Condition

- | Visual verification to confirm that the job is complete will be performed.
- | All tools, equipment, and unused materials will be removed, and appropriate housekeeping will be performed.
- | All grounding equipment, conductors, and devices will be removed.
- | All affected workers will be informed that lockout/tagout has been completed, the electrical supply is being restored, and that they are to move away from, and stay well away from, the equipment and electrical supply.
- | Quality control tests or checks will be performed on the repaired or replaced equipment, electrical supply, or both whenever it is appropriate.
- | Lockout/tagout devices will be removed.
- | The owner of the equipment, electrical supply, or both will be notified that the equipment, electrical supply, or both are ready to be returned to normal operation.
- | The disconnecting means will be returned to their normal condition.

Procedures Involving More Than One Person

- | When simple lockout/tagout is being performed and more than one person is involved in the job or task, each affected person will install his or her own personal lockout/tagout device.

Procedures Involving More Than One Shift

- | Whenever lockout/tagout extends beyond one day, it will be verified that lockout/tagout is still in place at the beginning of the following day.
- | When the lockout/tagout is continued on successive shifts, it is considered complex lockout/tagout. Simple lockout/tagout no longer applies.
- | When it becomes a complex lockout/tagout, the person in charge will identify the method for transfer of the lockout/tagout, and of communication with all affected workers.

Complex Lockout/Tagout

- | A written complex lockout/tagout plan will be established whenever one or more of the following exists:

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- | More than one energy source;
- | More than one crew;
- | More than one craft;
- | More than one location;
- | More than one employer;
- | Unique disconnecting means;
- | Complex or switching sequences; and/or
- | Lockout/tagout for more than one shift (new set of shift workers).
- | The written complex lockout/tagout plan will include the requirements established in the following sections of this program:
 - | Purpose;
 - | Responsibility;
 - | Preparation for Lockout/Tagout;
 - | Sequence of Lockout/Tagout System Procedures;
 - | Restoring the Equipment, Electrical Supply, or Both to Normal Condition;
 - | Procedures Involving More Than One Shift;
 - | Complex Lockout/Tagout;
 - | Discipline;
 - | Equipment; and
 - | Review.

Discipline

- | Violating the requirement of a (key in your company's name) lockout/tagout program for electrical safety will result in (key in the disciplinary action to be administered).
- | Operating a disconnecting means with an installed lockout/tagout device will result in (key in the disciplinary action to be administered).

Equipment

- | The locks used for lockout by (key in your company's name) workers are (key in the type and model of selected locks).
- | The tags used for tagout by (key in your company's name) workers are (key in the type and model of selected tags).
- | The test instruments used by (key in your company's name) workers are (key in the type and model of selected test instruments).

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Review

- | This program will be reviewed at least once each year. It was last reviewed on (key in the date that the program was last reviewed). It is scheduled to be reviewed again (key in the date scheduled for the next review, which must be less than 12 months from the previous review).

Lockout/Tagout Training

- | All affected workers will receive training on the following subjects before participating in lockout/tagout activities:
 - | Recognition of lockout/tagout devices;
 - | Proper installation of lockout/tagout devices;
 - | Duty of employer in writing procedures;
 - | Duty of affected workers in executing procedures;
 - | Duty of person in charge;
 - | Authorized and unauthorized removal of locks/tags;
 - | Enforcement of the execution of lockout/tagout procedures;
 - | Simple lockout/tagout;
 - | Complex lockout/tagout;
 - | Use of single-line and diagrammatic drawings to identify sources of energy;
 - | Alerting techniques;
 - | Release of stored energy;
 - | Personnel accounting methods;
 - | Temporary protective grounding equipment needs and requirements; and
 - | Safe use of test instruments.

**Appendix A
Model Complex Lockout/Tagout Plan**

Model Lockout/Tagout Program (NFPA 70E)

Complex Lockout/Tagout Plan for

(Key in Your Company's Name)

at

(Key in the Job Name)

Description

(Key in a brief description of the job/task, including identification of the equipment, its location, and the complex lockout/tagout required)

Qualified Person: _____

Mobile Phone #: _____

Date(s) of Task: _____

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(Key in your company's name) will be performing complex lockout/tagout on (key in the name of the equipment described above) because there is (delete any of the following 7 items that do not apply) more than one energy source, more than one crew, more than one craft, more than one location, more than one employer, unique disconnecting means, complex/particular switching sequences, more than one shift for this task.

Purpose

- | The purpose of this complex lockout/tagout plan is to ensure compliance with all applicable requirements of the (key in your company's name) lockout/tagout program.

Responsibility

- | Prior to the start of work on the system (key in the name of the person) will instruct:
 - | All affected workers in the significance of the complex lockout/tagout procedure with specific regard to worker safety;
 - | All new or transferred workers, and all others whose work operations are or may be in the area in the purpose and use of the complex lockout/tagout procedure; and
 - | All affected workers on their roles and responsibilities while implementing the complex lockout/tagout procedure.
- | All workers who are installing a lockout/tagout device will be required to sign their names and write the date on the tags.

Preparation for Lockout/Tagout

- | Prior to the start of work on the system (key in the name of the person) will verify that:
 - | Current diagrammatic drawings (or their equivalent), tags, labels, and signs have been carefully reviewed to identify and locate all disconnecting means, and to ensure that each of them are interrupted by a physical break;
 - | There is a current list of each disconnecting means to be locked and/or tagged out;
 - | All disconnecting means are reviewed to determine the adequacy of their interrupting ability;
 - | A determination has been made regarding whether it is possible to verify a visible open point, or whether other protective measures will be necessary;

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- | Other work activity has been reviewed to identify where and how other workers may be exposed to electrical hazards;
- | Other energy sources in the physical area have been reviewed to determine whether worker exposure to other types of energy sources needs to be addressed;
 - | Energy control methods have been established for control of other hazardous energy sources in the area;
 - | An adequately rated test instrument is at hand to test each phase conductor or circuit part;
 - | An adequate method has been established to determine that the test instrument is operating properly;
 - | Phase conductors or circuit parts are grounded wherever the possibility of induced voltages or stored electrical energy exists; and
 - | Ground connecting devices are applied where contact with other exposed energized conductors or circuit parts is possible.

Sequence of Lockout/Tagout System Procedures

- | (Key in the name of the person) will verify that the complex lockout/tagout system procedures sequence is administered as follows.
 - | All affected employees have been notified that a complex lockout/tagout system is being implemented;
 - | All affected employees have been notified why the lockout/tagout system is being implemented;
 - | (Key in the name of the qualified worker) knows the disconnecting means locations for all sources of electrical energy;
 - | (Key in the name of the qualified worker) knows the locations of all sources of stored energy;
 - | (Key in the name of the qualified person) is knowledgeable about the hazards associated with electrical energy;
 - | (Key in the name of the qualified person) has deenergized and disconnected the electrical supply, and all sources of stored energy, including capacitors have been relieved;
 - | Visual verification has been performed to ensure that the blades of disconnecting devices have been fully open, and draw-out type circuit breakers are completely withdrawn to a fully disconnected position;
 - | All disconnecting means are locked/tagged out with lockout/tagout devices;
 - | Additional safety measures, such as opening, blocking, or removing an additional circuit element have been performed when tagout alone is being implemented;
 - | The disconnecting means has been deemed non-operational by an

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- unsuccessful attempt to operate the system;
- | An appropriate and properly working test instrument is being used to determine that the electrical supply is deenergized and disconnected;
- | Proper test instrument operation is being verified on a known source of voltage prior to testing for absence of voltage;
- | Proper test instrument operation is once again verified on a known source of voltage immediately after testing for absence of voltage;
- | A grounding equipment conductor device is installed on the phase conductors or circuit parts to eliminate induced voltage or stored energy; and
- | Ground connecting devices that are rated for the available fault duty are applied whenever contact with other exposed energized conductors or circuit parts is possible.

Restoring the Equipment, Electrical Supply, or Both to Normal Condition

- | (Key in the name of the person) will verify that each of the following are completed in the order shown.
 - | Visual confirmation has been performed to ensure that the job is complete;
 - | All tools, equipment, and unused materials are removed, and appropriate housekeeping is performed;
 - | All grounding equipment, conductors, and devices are removed;
 - | All affected workers/personnel are informed that lockout/tagout has been completed;
 - | All affected workers/personnel are informed that the electrical supply is being restored;
 - | All affected workers/personnel are informed that they are to move away from, and stay well away from, the equipment and electrical supply;
 - | Quality control tests or checks are performed on the (key in either "repaired" or "replaced") equipment and electrical supply;
 - | Lockout/tagout devices are removed;
 - | The owner of the equipment and electrical supply is notified that the equipment and electrical supply are ready to be returned to normal operation; and
 - | The disconnecting means are returned to their normal condition.

Procedures Involving More Than One Shift

- | (Key in the name of the person) will verify that whenever lockout/tagout

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extends beyond one day, lockout/tagout is still in place at the beginning of the following day.

Discipline

- | (Key in the name of the person) will ensure that:
 - | Violations of the (key in your company's name) lockout/tagout program and/or this complex lockout/tagout plan will result in (key in the disciplinary action to be administered).
 - | Operation of a disconnecting means with an installed lockout/tagout device will result in (key in the disciplinary action to be administered).

Equipment

- | The locks to be used are (key in the type and model of selected locks).
- | The tags to be used are (key in the type and model of selected tags).
- | The test instrument to be used is (key in the type and model of selected test instruments).

Review

- | (Key in the name of the person) is responsible for reviewing and approving this complex lockout/tagout plan before the work begins.

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