

Great Western Painting

NFPA 70E

NFPA 70E Standard for Electrical Safety in the Workplace

OSHA has adopted by reference NFPA 70E-2000, *Standard for Electrical Safety Requirements for Employee Workplaces*.

A national consensus standard, such as NFPA 70E-2012, can sometimes be relevant to a general duty clause citation in the sense that the consensus standard may be used as evidence of hazard recognition and the availability of feasible means of abatement. The general duty clause, Section 5(a)(1) of the OSH Act, is violated if an employer has failed to furnish a workplace that is free from recognized hazards causing or likely to cause death or serious physical harm. The general duty clause is used where there is no standard that applies to the particular hazards involved.

All electrical work will be done in compliance with the National Electric Code (NEC), OSHA standards, and NFPA 70E. OSHA standards and NFPA 70E deal with worker safety. The NEC deals with the design, installation, and inspection of electrical installations.

A copy of NFPA 70E, 2012 Edition, will be readily available for reference, training, and employee use. This document may be purchased from the NFPA website at:

www.nfpa.org/

Training:

All employees who face electrical hazards that are not reduced to a safe level by the applicable electrical installation requirements will be trained in safety-related work practices and procedural requirements as necessary to provide protection from the electrical hazards associated with the job assignments. Employees will be trained to identify and understand the relationship between electrical hazards and possible injury.

Training will be in a classroom and/or on-the-job and the degree of training will be determined by the risk to the employee.

Employees will receive training in emergency procedures including methods of release from contact with exposed energized electrical conductors or circuit parts; methods of first aid; and CPR if the duties warrant such training. The Safety Director will certify that employees have been trained in approved methods of resuscitation annually.

Training for Qualified Persons:

Note: A qualified person has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved.

1. Qualified persons must be trained and knowledgeable of the construction and operation of equipment or a specific work method and to recognize and avoid the electrical hazards with respect to the equipment or work methods.
 - a. Qualified persons will be familiar with the proper use of special precautionary techniques, PPE, including arc-flash, insulating and shielding materials, and insulated tools and test equipment.

Note: A person can be qualified with respect to certain equipment and methods but still be unqualified for others.

- b. Only qualified persons will be permitted to perform tasks such as testing, troubleshooting, and voltage measuring within the Limited Approach Boundary of exposed energized electrical conductors and circuit parts operating at 50 volts or more or where an electrical hazard exists and will be trained in the following:
 - 1) The skills and techniques necessary to distinguish exposed energized electrical conductors and circuits parts from other parts of electrical equipment
 - 2) The skills and techniques necessary to determine the nominal voltage of exposed energized electrical conductors and circuit parts.
 - 3) The approach distances specified in Table 130.2(c) and the corresponding voltages to which the qualified person will be exposed.
 - 4) The decision-making process necessary to determine the degree and extent of the hazard and the PPE and job planning necessary to perform the task safely.
- c. If undergoing OJT and, in the course of the OJT has demonstrated an ability to perform duties safely under the direct supervision of a qualified person, this person will be considered qualified for the performance of these duties.
- d. Tasks performed less often than once per year will require retraining before performance of the work practices involved.
- e. Qualified persons will be trained to select an appropriate voltage detector and demonstrate how to use a device to verify the absence of voltage, including interpreting indications provided by the device. They also will be trained to understand all limitations of each specific voltage detector that may be used.

Training for Unqualified Persons:

Unqualified persons will be trained in and be familiar with any of the electrical safety related practices that are necessary for their safety.

NOTE: Unqualified persons will not be permitted to enter spaces that are required to be accessible to qualified employees only unless the electric conductors and equipment involved are in an electrically safe work condition.

Retraining:

Retraining must be given at intervals not to exceed 3 years **and** when:

- a. Supervisors or annual inspections indicate that the employee is not complying with the safety-related work practices.
- b. New technology, new types of equipment, of changes in procedures necessitate the use of safety-related work practices that are different than those the employee would normally use.
- c. The employee must employ safety-related work practices that are not normally used during regular job duties.

Training Documentation:

The company will document that each employee has received the training above **after** the employee demonstrates proficiency in the work practices involved and will be maintained for the duration of the employee's employment. Training documentation will contain the employee's name and dates of training.

Host Employer Responsibilities:

The host employer will inform contract employers of:

- a. Known electrical hazards that are related to the contract employer's work that might not be recognized by the contract employer or its employees.
- b. Information about the employer's installation that the contract employer needs to make assessments.

The host employer will report observed contract employer related violations (dealing with electrical work) to the contract employer.

Contract Employer Responsibilities:

- a. The contract employer will ensure that each of its employees is instructed in the hazards communicated to the contractor employer by the host employer. This instruction is in addition to the basic instruction required by NFPA 70E.
- b. The contract employer will ensure that each of its employees follow the work practices required by NFPA 70E and safety-related work rules required by the host employer.

- c. The contractor employer will advise the host employer of:
 - 1) Any unique hazards presented by the contract employer's work.
 - 2) Any unanticipated hazards found during the contract employer's work that the host employer did not mention.
 - 3) The measure the contractor took to correct any violations reported by the host employer and prevent such violations from recurring in the future.

Electrical Safety Program:

The employer will implement and document an overall safety program that directs activity appropriate for the voltage, energy level, and circuit conditions.

Safety related work practices are only one component of an overall an electrical safety program.

Electrical Safety Program Procedures:

The program will address safety related work practices for working within the Limited Approach Boundary. Program elements found in Annex E to NFPA 70E would be included such as evaluations, anticipating unexpected events, electrical flash arc hazard analysis, and the fact that all electrical parts are considered live until proven otherwise.

Risk/Hazard Evaluation Procedures:

Risk/hazard evaluation procedures are to be used before work is started within the Limited Approach Boundary of energized electrical conductors and circuit parts operating at 50 volts or more or where an electrical hazard exists. An example of Hazard/Risk Evaluation Procedures as well an example of a Hazard Risk Analysis Evaluation Flow Chart is found in Annex F to NFPA 70E. It would contain event severity, frequency, probability and avoidance to determine the level of safe practices to be employed.

Pre-Job Briefings for Routine Work:

Prior to performing routine work [routine work is not complicated or particularly hazardous and the employee should be able to recognize and avoid hazards presented], a job briefing will be held before each job and include all employees involved. Topics would include hazards associated with the job, work procedures involved, special precautions, energy source controls, and PPE requirements.

Test Instruments and Equipment:

All test instruments, equipment, and their accessories will be rated for the circuits and equipment to which they will be connected. Further they will meet the requirements of ANSI/ISA-66010-1, *Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements*, for rating and design requirements for voltage measurement and test instruments intended for use on electrical systems 1000 volts and below.

Operations Verification:

When test instruments are used for the testing for the absence of voltage on conductors or circuit parts operating at 50 volts or more, the operation of the test instrument will be verified before and after an absence of voltage test is performed.

Insulating PPE Maintenance and Use:

Electrical protective equipment will be maintained in a safe, reliable condition. Insulating equipment will be inspected for damage before each day's use and immediately following any incident that can reasonably be suspected of having caused damage. Insulating gloves will be given an air test along with the inspection.

Maximum test intervals for rubber insulating equipment will be in accordance with NFPA 70E Table 130(c)(6)(c). Time frames for testing would include: 1) Blankets-before first issue/every 12 months, thereafter, 2) Gloves-before first issue and every 6 months, and, 3) Sleeves-before first issue and every 12 months. Covers and line hose will be tested if insulating value is suspect.

Energized Electrical Work Permit:

Note: Work on energized electrical conductors or circuit parts that are not placed in an electrically safe work condition, shall be considered energized electrical work and shall be performed by written permit only.

Reference Annex J to NFPA 70E. Energized Electrical Work Permits **are not** part of NFPA 70E. Within Annex J, however, are both an example of a Energized Electrical Work Permit and a Flow Chart to illustrate items to consider when determining the need for the permit.

In every case, if the voltage level is ≥ 50 volts **AND** there are exposed live parts, an Energized Electrical Work Permit is required.

In Part I [to be completed by the Requester] of the Energized Electrical Work Permit will include:

1. Job/Work Order Number.
2. Description of the work to be done.

3. Justification of why the circuit/equipment cannot be de-energized or the work deferred until the next scheduled outage.
4. Requester Name, Title, and Date.

In Part II [to be completed by the Electrically Qualified persons **doing** the work] of the Energized Electrical Work Permit will include:

1. Detailed job description procedure to be used in performing the above detailed work.
2. Description of the Safe Work Practices to be employed.
3. Results of the Shock Hazard Analysis.
4. Determination of the Shock Protection Boundaries.
5. Results of the Arc Flash Hazard Analysis.
6. Determination of the Arc Flash Protection Boundary.
7. Necessary personal protective equipment to safely perform the assigned task.
8. Means employed to restrict the access of unqualified persons from the work area.
9. Evidence of completion of a Job Briefing including discussion of any job-related hazards.
10. A signed and dated agreement by each Electrical Qualified Person that the above work can be done safely.

In Part III of the Energized Electrical Work Permit will include:

Signed and dated approval(s) by persons such as:

1. Manufacturer Manager
2. Safety Manager
3. General Manager
4. Maintenance/Engineering Manager
5. Electrically Knowledgeable Person

Illumination of Work Areas:

Employees will not enter spaces containing electrical hazards unless illumination is provided that enables the employees to perform the work safely. Where lack of illumination or an obstruction precludes observation of the work to be performed, employees will not perform any task with the Limited Approach Boundary of energized electrical conductors or circuit parts operating at 50 volts or more or where an electrical hazard exists.