

Confused by NFPA 70E?

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In September 1999 a major U.S. corporation experienced an electrical accident that resulted in serious burn injuries to an electrical apprentice employee. OSHA (Occupational Safety and Health Administration) investigated the accident and issued a number of citations. The employer challenged the citations and the disagreement ended up before the Occupational Safety and Health Review Commission.

As part of the citation OSHA contended that the employer violated a federal regulation because it did not provide or require that its electricians wear appropriate flame-resistant or retardant personal protection, specifically, flame-resistant coveralls and insulated gloves. OSHA also contended that the employer violated a regulation when it did not provide or require that its electricians wear appropriate face protection.

In the settlement the employer agreed to develop hazard analyses in accordance with the personal protective equipment provisions contained in NFPA (National Fire Protection Association) 70E. OSHA agreed that given the present state of its standards and regulations, the hazard analyses would achieve compliance with their requirements.

OSHA has not adopted NFPA 70E, does not mandate 70E compliance, yet you can be cited for non-compliance!! How is this possible?

A Little Background

With the passing of the Williams-Steiger Occupational Safety and Health Act of 1970 came the need for occupational safety and health regulations. Congress directed the OSHA to develop new regulations utilizing existing “national consensus standards” (see sidebar) and established Federal standards. For its electrical safety regulations the Secretary adopted the national consensus standard NFPA 70, better known as the NEC[®] (National Electrical Code[®]). However, OSHA encountered several problems utilizing the latest editions of the NEC including:

1. The extensive legal process of adopting each new NEC[®] edition and the risk of creating potential conflicts between the adopted version and the published version.
2. The NEC[®] is only an electrical installation standard and does not address electrical safety in the workplace.
3. The NEC[®] includes provisions not relevant to the workplace.

To correct these problems and others, NFPA created a new committee to develop electrical safety standards that would serve the needs of OSHA. This committee reports through the NEC[®] technical committee and is called the Committee on Electrical Safety Requirements for Employee Workplaces - NFPA 70E.

The first NFPA 70E standard was published in 1979, but it wasn't until the fifth edition in 1995 that many of the current workplace safety requirements were included. The 2004 NFPA 70E is actually the seventh edition.

What is NFPA 70E?

In NFPA's catalog they state: "70E covers the full range of electrical safety issues from safety-related work practices to maintenance, special equipment requirements, and installation. In fact, OSHA bases its electrical safety mandates – OSHA 1910 Subpart S and OSHA 1926 Subpart K – on the comprehensive information in this important Standard."

The 2004 edition of NFPA 70E has an introduction, four chapters and thirteen annexes.

Chapter 1 - Safety-Related Work Practices; is the meat of the 70E document. It covers training requirements for Qualified and Unqualified persons, which determines who is permitted to work on or near exposed energized parts. It requires an Electrical Safety Program and covers what shall be included in it. Requirements for LOTO (Lockout/Tagout) are covered as are the procedures for the three levels of LOTO control – Individual, Simple, and Complex.

Chapter 1 is also the home of the "hot topics": Electrical Hazard Analysis for Shock and Flash, Energized Electrical Work Permits, Approach Boundaries for Shock, Arc-Flash Boundaries, and selection of PPE (Personal Protective Equipment) for electrical safety.

Chapter 2 - Safety-Related Maintenance Requirements; is a chapter that does not create much discussion. It basically requires that electrical components, wiring, and equipment be maintained in a safe condition. Most electricians will find that this chapter only documents what they already know as good electrical maintenance.

Chapter 3 - Safety Requirements for Special Equipment; covers batteries, lasers and power electronic equipment. This chapter addresses a few very specific types of electrical equipment that may have hazards different than the common shock and flash hazards. Many facilities now use lasers in laboratories and in workshops, and batteries are common for many uses including in UPS (Uninterruptible Power Supply) systems. Included in chapter 3 is a section on Safety-Related Work Practices for Power Electronic Equipment which specifically includes such things as electric arc welding equipment, and process equipment that have rectifiers and inverters such as: motor drives, UPS systems, and lighting controllers. There are no surprises in this chapter but if you have the subject equipment, you should read this chapter.

Chapter 4 – Installation Safety Requirements; is a very truncated version of the NEC[®]. This chapter is based on applicable sections of the NEC[®], but is not intended to be used in lieu of the NEC[®].

Annexes A through M include very useful information such as defining approach boundaries, how to calculate flash protection boundaries, a sample LOTO procedure, a simplified method for selecting flame-resistant clothing, and a sample Energized Electrical Work Permit.

Is compliance with NFPA 70E mandatory?

No! NFPA 70E – Standard for Electrical Safety in the Workplace is a national consensus safety standard published by the NFPA primarily to assist OSHA in preparing electrical safety standards. This standard has been approved as an American National Standard, but OSHA has not incorporated it into the Code of Federal Regulations.

Some OSHA state plans are more restrictive than federal OSHA and as such, may have adopted or incorporated 70E. This is addressed on a state-by-state basis and should be evaluated by each employer location. After researching several states on this issue, the responses were too varied to incorporate into this report.

Can You be Cited for Not Complying with NFPA 70E?

Yes! In the event of a serious electrical shock or arc-flash burn accident, history has shown that among their citations, OSHA will likely cite non-compliance with 29CFR 1910.335(a)(1)(i) which requires the use of protective equipment when working where a potential electrical hazard exists and 29CFR 1910.132(d)(1) which requires the employer assess the workplace for hazards and the need for personal protective equipment.

Both of these regulations are written in general terms with no details of how to assess electrical hazards or how to select the proper personal protective equipment. Here is where NFPA 70E can come into play. NFPA 70E is a “how-to-comply” instruction manual for several of OSHA’s regulations including electrical hazard assessments and how to select the appropriate personal protective equipment for electrical hazards.

Another way OSHA can utilize NFPA 70E is through the “General Duty Clause” (see sidebar on this subject). In practice, OSHA, court precedent, and the review commission have established that if the following elements are present, a “general duty clause” citation may be issued.

1. The employer failed to keep the workplace free of a hazard to which employees of that employer were exposed.
2. The hazard was causing or was likely to cause death or serious physical harm.
3. The hazard was recognized. (Through your safety personnel, employees, organization, trade organization or industry customs, etc.)
4. There was a feasible and useful method to correct the hazard.

In the event of a serious arc-flash injury to an employee, OSHA will likely establish that the first two elements existed, #1 - the employer had a hazard and #2 - it was likely to cause death or serious injury. But what about elements #3 - was the hazard recognized and #4 - was there a feasible method to correct it?

Was the Hazard Recognized:

2002 NEC[®] Section 110.16 Flash Protection:

Requires warning labels to be installed on electrical equipment where workers are likely to be exposed to a potential arc-flash.

In a 2003 “Standards Interpretation” letter, OSHA stated:

Industry consensus standards may be used as evidence that a hazard is “recognized”. (NFPA 70E is an industry consensus standard and it does address shock and arc-flash hazards.)

Was the Hazard Feasible to Correct:

2002 NEC[®] Section 110.16 Flash Protection:

A fine print note refers readers to NFPA 70E for assistance in determining the flash hazard, PPE, and safe work practices.

OSHA 29 CFR 1910 Subpart S Appendix A - Reference Documents:

States that NFPA 70 and 70E can be helpful in understanding and complying with the requirements of Subpart S – Electrical.

Still confused? Here's the bottom-line:

Many OSHA regulations are written in general terms leaving the details up to the employer on how to comply. The employer is expected to use consensus standards to help in the selection of the best method to achieve compliance with the OSHA regulations. NFPA 70E is not a Federal regulation, it is a “how to comply” consensus standard for specific OSHA regulations. Compliance with 70E will assure compliance with some OSHA electrical regulations.

In the event of an injury or death due to an electrical accident, if OSHA determines that compliance with 70E would have prevented or lessened the injury, OSHA may cite the employer under the “general duty clause” for not using 70E to protect the employee(s). In a 2003 “Standards Interpretation” letter OSHA stated 70E can be used as evidence of whether the employer acted reasonably.

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SIDEBAR

“General Duty Clause” – Section 5(a)(1) in the ACT.

Occupational Safety and Health Act of 1970

5. Duties

(a) Each employer

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

Section 5(a)(1) has become known as the “General Duty Clause”. It is a catch all for citations if OSHA identifies unsafe conditions to which a regulation does not exist.

SIDEBAR

“National Consensus Standard”

29 CFR 1910.2(g)

A standard from a nationally recognized standards-producing organization that considered diverse views and was agreed upon by persons interested and affected. Some examples of organizations that publish national consensus standards include NFPA and ASTM. By definition NFPA 70E is a national consensus standard.