



## ARC FLASH REGULATIONS



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Being responsible for your workers' safety means being up to date on the various regulatory and consensus standards applicable to arc flash hazards. The four major industry standards that have the most impact are OSHA regulations, NFPA 70, NFPA 70E, National Electrical Code® and IEEE Standard 1584. Here is a summary of those regulations.

## OSHA REGULATIONS

OSHA regulations mandate that employers provide a safe workplace. Specifically, OSHA Standard 29 CFR Part 1910, Subpart S, addresses safety-related practices for electrical work. It makes clear that, with very few exceptions, equipment must be de-energized before work is performed, and lockout/tagout procedures must be followed.



However, if equipment cannot be de-energized prior to work, the standard requires that:

- Employees are properly protected by personal protective equipment (PPE) appropriate for the work being performed.
- Employers perform an electrical hazard assessment to determine if hazards are present or likely to be present, select the necessary PPE, and communicate those selection decisions to each affected employee.

See the OSHA Standards box (next page) for specific text from Subpart S. In addition, OSHA 29 CFR Part 1910 contains many other sections that pertain to electrical safety and arc flash hazards. They address safety requirements, personal protective equipment, and general environmental controls, such as lockout/tagout.

## IEEE STANDARD 1584 TM-2002

As implied by its title, Guide for Performing Arc Flash Hazard Calculations, IEEE Standard 1584 provides techniques for performing a comprehensive arc flash hazard analysis. Its systematic, nine-step approach enables designers and facility operators to determine the arc flash-protection boundary, defined as "an approach limit at a distance from exposed live parts within which a person could receive a second-degree burn if an electrical arc flash were to occur." Of course, there are other benefits to performing an electrical hazard analysis. By providing an in-depth look at your plant's electrical system, it supplies data that can be used to improve overall system performance, reduce downtime and manage costs.



## THE NFPA 70E STANDARD

For details on how to conduct an electrical hazard assessment or how to select PPE, you must look to national consensus standards.



NFPA 70E, Standard for Electrical Safety in the Workplace, is one of the foremost consensus standards for electrical safety. Developed by the National Fire Protection Association, it addresses employee protection from the electrical hazards of shock and arc flash.

Referenced in OSHA 29CFR Part 1910, Subpart S, Appendix A, NFPA 70E is considered by OSHA to be the recognized industry practice for electrical safety. In its standard interpretation of the relevance of NFPA 70E, OSHA states:

*Industry consensus standards, such as NFPA 70E, can be used by employers as guides to making the assessments and equipment selections required by the standard. Similarly, in OSHA enforcement actions, they can be used as evidence of whether the employer acted reasonably.*

Chapter 1 of NFPA 70E provides guidance on establishing electrically safe work conditions and developing such safety-related work practices as a safety program and worker training. And while it emphasizes that working on live parts is "the last alternative work practice," NFPA 70E contains extensive requirements for working on energized electrical conductors or circuit parts that have not been put into an "electrically safe condition." One of the requirements is electrical hazard analysis, which includes arc flash hazard analysis.

## NFPA 70, THE NATIONAL ELECTRICAL CODE®



While the NEC has traditionally addressed installation techniques intended to prevent fire, electrocution and shock hazard, it now contains requirements related to arc flash hazards.

Section 110-16, Flash Protection, requires that markings be placed on switchboards, panelboards, industrial control panels and motor control centers to warn qualified persons of potential arc flash hazards.

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