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NFPA 70E: Changes and Implications for 2012

Robert (Bob) Clukey, AS, BS
Instructor, American Trainco
Certified NCCER and OSHA instructor

Introduction

Everyone can help ensure electrical safety in the workplace, but employers and safety professionals have a special interest in ensuring that employees go home safely at the end of the day. There are many ways to create and increase electrically safe working conditions, and they are all based on training and awareness of what constitutes an electrical hazard, and arranging the workplace to minimize or eliminate such hazards.

The NFPA 70E, *Standard for Electrical Safety in the Workplace* (2012), outlines provisions for employers to protect employees from electrical hazards. NFPA 70E covers safety-related work practices, safety-related maintenance requirements, and safety requirements for special equipment.

As someone with a particular interest in safety and arranging the workplace to minimize or eliminate such hazards, you are likely already aware that there were changes to NFPA 70E©, *Standard for Electrical Safety in the Workplace,* for 2012. This paper will discuss some of those changes and their impact on the workplace.

Most of the significant 2012 changes are in Chapter 1; changes to Chapters 2 and 3 were largely made for clarification and editorial reasons. Changes to the Annexes are mainly evident to in Annex F, D, H, J, and O, with a new Annex.

How will you know whether these changes affect you? It's simple: NFPA 70E standards are for the workplace, so most, if not all, employers will be affected. That means many employees will be affected as well. While electrical safety training for employees is a great place to start ensuring workplace safety, as an employer you can inform yourself by becoming familiar with the changes to NFPA 70E and determining how they will specifically affect your workplace.

Overall Changes

The overall changes made in the 2012 edition of NFPA 70E are discussed below.

Change to Arc Flash Wording

The 2009 edition of NFPA 70E used the term “arc flash protection boundary,” while the 2012 edition of NFPA 70E uses the term “arc flash boundary.” This is a subtle change that deletes the word *protection*.

Changes to the Introduction

90.2 (A) Covered

Changes to 90.2 (A) focus on safe work practices, not merely on safety requirements. As well, 90.2 (A) now mentions inspection as an activity requiring extra electrical safeguards, and refers to safe work practices for “employees performing other work activities that can expose them to electrical hazards.”

This broadens the scope of safe electrical work practices and those who are required to adhere to them, which could mean increased measures of compliance or increased liability for failure to comply.

Changes to Chapter 1

Arc-Rated and Article 100

The 2012 edition of NFPA 70E will use the term “arc-rated” or “AR” before any reference to “flame-resistant” or “FR.” The term “arc-rated” refers to a material property or attribute in terms of a material’s performance when exposed to an electric arc. Arc-rated material is flame-resistant, but flame-resistant material may not be arc-rated.

Article 100 Definitions, Informational Note No. 1, states that arc-rated clothing or equipment indicates that it has been tested for exposure to an electric arc. Flame-resistant (FR) clothing without an arc rating has not been tested for exposure to an electric arc.

Article 105

This is a new article that highlights requirements that were previously found throughout Article 110. Article 105 is quite clear that the employer must provide the safety-related work practices and training on those practices. While this is not a new requirement, the extraction of this information into a new article underscores the extent of the employer’s responsibility.

Article 110

Article 110 covers general requirements; 110.2 includes training requirements. The 2012 edition of NFPA 70E adds this information to 110.2(D)(1)(f): “The employer shall determine, through regular supervision and through inspections conducted on at least an annual basis, that each employee is complying with the safety-related work practices required by this standard.”

Article 110.2

Article 110.2(E) clarifies that the documentation of employee training “shall contain the content of the training, each employee’s name and dates of training.” While this does not change the need for training, it does afford considerations for those performing electrical inspections.

Article 110.3

Article 110.3(G) adds requirements to the job briefing, most notably that information from the energized electrical work permit, if required, must be added to the job briefing. While the scope of a job briefing does not change considerably, this does mean that the energized electrical work permit needs to be completed prior to the job briefing and prior to any additional job briefings.

Article 110.4

Article 110.4 adds language regarding GFCI protection for employees, and requires that employees are provided with GFCI protection as required by local, state, or federal regulations. This includes outdoor work. While this may not involve major fiscal outlay, this does mean that it is even more important to be familiar with local, state, and federal regulations that are related to electrical safety but may not be specified in the NFPA 70E or in the NEC.

Article 130

Article 130 discusses work involving electrical hazards, and sets forth the allowable exceptions of infeasibility or greater hazard when working on energized equipment greater than 50 volts.

While the allowable exceptions have not changed, NFPA 70E (2012) specifies that, "All requirements of this article shall apply whether an incident energy analysis is completed or if the tables 130.7(C)(9) and (C)(10) are utilized in lieu of an incident energy analysis in accordance with 130.3 Exception No. 2." (130.1) This language indicates that regardless of the method used (table or analysis), other requirements for working safely with electrical hazards still apply.

Article 130 and PPE Requirements

Article 130 also contains changes to personal protective equipment (PPE) requirements:

- Table 130.7 specifies that hearing protection is required within the arc flash boundary.
- Arc flash protection for hands now specifies heavy-duty leather gloves (.7 mm minimum) or arc-rated gloves.
- There are operations where leather gloves or rubber gloves with leather protectors may not allow the worker the dexterity required to perform the tasks in question. The NFPA 70E standard states that in such a situation, the requirements of ASTM F 496, *Standard Specification for In-Service Care of Insulating Gloves and Sleeves*, must be met. It is possible but not guaranteed that, in such a situation, arc-rated gloves will meet NFPA 70E requirements.

Both Article 130 and Annex M contain language stating that garments that are not arc-rated cannot be used to increase arc ratings of other clothing or garment systems.

Article 130.2

Article 130.2 further clarifies that energized parts must be put into an electrically safe work condition if the employee is within the limited approach boundary or in a situation where the parts might not be exposed, but there is an "increased risk of injury from an exposure to an arc flash hazard."

Article 130.2 also expands on the energized electrical work permit requirements, so that an energized electrical work permit is now required when working within the limited approach boundary or the arc flash boundary of exposed energized parts.

The article also details the results of the shock hazard analysis and arc flash analysis that must be included in the permit. If you have a standard template for your energized electrical work

permits, this change could necessitate reviewing that template and either making revisions or potentially creating new templates for different energized work situations.

Article 130.5

Article 130.5 discusses equipment labeling, and now specifies what types of equipment require labeling, as well as what that labeling must include. Significantly, this article no longer includes the "four-foot rule" for the arc flash boundary; instead, the arc flash boundary is defined as "the distance at which the incident energy equals 5 J/cm^2 (1.2 cal/cm^2)."

Detailed information on calculating the arc flash boundary is provided in Annex D.

Note that Annex D references the "two-second rule," based on information from IEEE 1584 Section B.1.2. The "two-second rule" assumes that two seconds is a reasonable maximum time. Annex D also provides information and resources for calculating incident energy from a DC arc flash.

Although not required by NFPA 70E, equipment labeling can also benefit from including information about "where" the equipment is fed from, as this can facilitate a successful lockout/tagout program and correctly and completely de-energize.

Changes to Chapter 2

Most of the changes to Chapter 2 are editorial and do not significantly affect the intent of the articles.

Article 205.2

This article now specifies that single-line diagrams must be maintained in a legible condition and kept current. This should not present an undue burden, but is an added record-keeping requirement. If your facility has other diagrams, drawings, or schematics, you might consider keeping all of these updated and legible, perhaps performing a regular audit of such drawings.

Article 205.3

Article 205.3 from the 2009 NFPA 70E has been expanded into articles 205.3 and 205.4. This should not present any compliance requirements, but it does treat overcurrent protective devices separately.

Conclusion

As with any reference that is periodically revised, a number of changes are merely for clarity or to correct editorial issues, and the NFP 70E is no exception. However, changes are also meant to address changing technology and working conditions, so any employer or safety professional responsible for electrical safety needs to have, at minimum, a working understanding of those changes and how they affect your facility.

A number of the 2012 changes involve increased documentation requirements, particularly for training. Other changes involve an addition to most workflows. As a safety professional, you have no doubt already considered the implications of changes to the 2012 edition of NFPA 70E. Here are some questions that may guide your planning process:

- Do you need to revise your safety practices or policies?

- How will you ensure your policies and practices meet all applicable requirements for different standards such as NFPA, NEC, ANSI, and ASTM?
- Do you have a realistic time frame for that process?
- What kind of resources do you have for the project?
- How will policy changes affect your workflow?
- Do you need to change warning labels?
- How will you audit the physical plant to ensure warning labels are updated?
- How will you document that audit?
- Do employees understand changed PPE requirements?
- Does the employer need additional PPE to ensure requirements are met?
- Do you have a specific plan for implementation?

The answers will be different for each of you and for each employer and work environment, and ensuring compliance with these changes can be a significant undertaking. However, you might consider these changes as not merely an opportunity to ensure compliance with new standards, but to revisit general policies, or to reassess your PPE on hand and its condition, and to refresh employees on electrically safe work practices and changes. Since the electrical safety program is required to be audited every three years, this could be a great time to add this kind of review to your program.