More Arc Flash Rules?
Navigating the Changes in NFPA 70E - 2009
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Keeping people safe has always been a priority. Safety rules and regulations continually change, but the results have led to more people going home safely.

The writers behind the now-published and newly active NFPA 70E – 2009 – "Electrical Safety in the Workplace" standard have clearly spent time thinking through what it takes to keep electrical workers safe. NFPA 70E is the standard for electrical safety, and OSHA is already enforcing the new requirements. If followed, NFPA 70E-2009 will reduce the number of critical injuries to electrical workers.

Although some version of NFPA 70E has been around for many years – efforts to first address arc flash started in 1995 - its implementation has been slow and spotty. Additional detail and requirements have been added with each update of the standard. Moving forward, expect enforcement of the standard to be ramped up due to increased awareness of arc flash hazards and changes in government administration.

Some of these changes are significantly different than earlier requirements (and practice). We felt we could help out by pointing out the key changes in the new standard. It's important for owners and project players to be familiar with the updated requirements to ensure electrical safety and reduce risk.

Not all of the changes can be addressed in the context of this article, but it's important to touch on the key items.

KEY CHANGES TO NFPA 70E 2009:

General Additions & Clarifications

1. Clarifies that the NFPA 70E standard applies not just for installation (construction), but for *any* work around electricity *(Source 90.2).*

2. Emphasizes that calculations are based on incident energy, rather than all arc flash hazards. (Other hazards such as arc blast, hearing damage and respiratory damage are not considered in the incident energy calculations)

3. Chapter four, which covered installation methods, was eliminated. NEC maintains the accepted standard for installation methods.

4. Three annexes were added. These help clarify the requirements of the standard:
    a. "M" pertains to the layering of protective clothing
    b. "N" addresses working near overhead lines
    c. "O" covers safety related design requirements

5. The relationships and responsibilities among contractors, outside service personnel, and host employers (GCs and owners) were clarified *(Source: 110.5)*.

a. The host employer must identify known hazards and be given information about the installation in order to make appropriate assessments.
b. The contract employer must communicate the known hazards from the host employer as well as advise them of any unique hazards to their work. This includes unanticipated hazards found during their work.

6. Requirements have been added to ensure employees don't enter "look a like" equipment *[Source: 130.7 (E)(4)]*. One of the following three items must be used to prevent entrance:
    a. Safety signs and tags
    b. Barricades
    c. Attendants

Arc Flash & Energized Work *(Source: 130.3)*

1. An arc flash definition was added, stating that enclosed equipment is only an arc flash hazard when it's being interacted with. For example, someone would not have to suit up in appropriate PPE in order to walk through an equipment room.

2. Visual inspection is now exempted from being "energized work." This is if the person is crossing the limited approach boundary, but not crossing the restricted approach boundary (Source: 130.2)

3. Two categories were added to distinguish between the types of electrical energized work:
    a. "Diagnostic" is measuring without making physical changes
    b. "Repair" is actually making physical changes, including tightening, etc.

4. An updated arc flash analysis is necessary whenever a major modification or renovation takes place and once every five years to account for everything from a utility change you may not be aware of, to maintenance items such as fuse changes and breaker adjustment settings.
    a. The standard also notes that the condition of maintenance of over-current devices (breakers) is a concern. If breakers are not maintained, then the fault clearing time may be much longer than the manufacturer's documentation and would therefore increase the arc flash hazard substantially.

5. Specific energy levels are now required to be added to equipment Arc Flash labels; compelling a specific analysis to be done
    a. Equipment must be field labeled with the available incident energy or the level of PPE required *[Source 130.3 (C)]*.
    b. This is moving away from the NFPA 70E tables being used for determining the arc flash hazard category.
    c. There is an exemption for circuits 240V or less that are fed by a transformer less than 125kVA. These can be considered a class 0 hazard.

6. Table 130.7 (C)(9)

a. The boundaries of the short circuit and clearing time limits have been clarified. An arc flash analysis will need to be performed when outside these limits or tasks that are listed.
b. These tables are based on the experience of the task group and not calculations or tests.
c. These tables are likely to be modified or eliminated throughout future revisions as specific energy level calculations are required.

Personal Protective Equipment *(Source: 130.7)*

1. Arc flash PPE has been differentiated from fire resistant PPE. Arc Rated PPE is tested to withstand the forces during an arc event in addition to the Fire Resistant rating of the material.

2. Upgrades the PPE (Personal Protective Equipment) requirements:
    a. PPE must be arc rated (AR), not just fire resistant (FR) rated.
    b. Hair & beardnets need to be arc rated if they are worn during electrical work.
    c. An arc rated balaclava with face shield or special arc-resistant goggles is now an acceptable alternate to a hood.
    d. Hearing protection has been added as a requirement.
    e. Face shields for Hazard Category 1 are now required.
    f. Long jackets or "smocks" will no longer meet the arc flash PPE requirement. Pants or another solution must be used to protect the lower body.
    g. Arc-rated rainwear, jackets, and parkas have new requirements

3. There are some concerns with overusing PPE as well.
    a. Immobility, loss of dexterity and increased working environment temperature may increase the risk for injury. Because of this, the proper identification of PPE to select the most appropriate level of PPE is important for overall safety of the person.

Training & Documentation

1. The new standard requires documentation and auditing of an electrical safety program. However, the auditing frequency is determined by the employer based on the complexity of systems and equipment being encountered.

2. Training requirements have been updated. Any training or retraining must be specific and documented for each qualified employee.
    a. CPR training is required yearly. This is more frequent than the 24 month standard of the American Heart Association *[Source 110.6 (C)]*.
    b. If a task happens less often than once per year, retraining must be conducted before that task is performed again.
    c. When an employee is not complying with safety related work practices, retraining must occur.
    d. Training is required when procedures, technology, or equipment changes.
    e. If an employee is using equipment that they would normally not use during their regular job duties, they will need to be trained prior to using this equipment.

3. Voltage detector training must be conducted, and verifications must be performed before and after the test.

COMING SOON

Standard writers and educators familiar with this issue have projected other changes will likely be coming. It may be helpful to be thinking of these issues as you establish revised policies and processes in your facility:

1. Energized work will continue to be strongly discouraged. Few exceptions are expected unless for life safety or utility interruption issues. The burden of showing the "need" will shift to those asking for the work to be done energized (the client) rather than those doing the work. "No Energized Work" will become the rule, rather than the exception.

2. The current Hazard/Risk tables could be removed or changed dramatically to require a specific arc flash analysis be performed or to require more restrictive PPE.

3. The 2011 NEC (Electrical Code itself) may require specific arc flash values on labels as well, leading to more frequent enforcement by local authorities (rather than just OSHA as is under 2009 NFPA 70E).

Keeping people safe is the ultimate goal. We support these efforts and celebrate as more and more industry professionals go home safely. We stand ready to partner with you to make these changes.

If you would like assistance making your site safer, please contact Brent Kooiman at brent.kooiman@interstates.com or (712)722-1664 ext. 302.