NFPA 70E
Standard For Electrical Safety In The Workplace
EEI Safety and Health Meeting October 2012
## NFPA Structure

NFPA 70E Technical Committee reports to NEC
Technical Correlating Committee reports to NFPA Standards Council

**EEI Representatives to the TC:**
- Mike Madrigal, KCP&L (Principal)
- John Boothroyd, Entergy (Alternate)

**EEI Representatives to the NEC TCC:**
- Neil LaBrake, Jr., National Grid (Principal)
- Tom Adams, ComEd Retired (Alternate)

**EEI Staff Liaison**
- Chuck Kelly
NFPA 70E 2015 Revision Cycle

Received 462 Public Input
Created 168 First Revisions
90.2 Scope.

(A) Covered. This standard addresses electrical safety-related work practices, safety-related maintenance requirements and other administrative controls for employee workplaces that are necessary for the practical safeguarding of employees relative to the hazards associated with electrical energy during activities such as the installation, inspection, operation, maintenance, and demolition of electric conductors, electric equipment, signaling and communications conductors and equipment, and raceways. This standard also includes safe work practices for employees performing other work activities that can expose them to electrical hazards as well as safe work practices for the following:

FR-14
# NFPA 70E 2015 Revision Cycle

## ARTICLE 100 Definitions

**Has 24 First Revisions in this section**

### Deletions:

- **Arc Flash Hazard Analysis. FR-15**
- **Bare-Hand Work. FR-168** (through out the whole standard)
- **Boundary, Prohibited Approach. FR -121**
**NFPA 70E 2015 Revision Cycle**

**ARTICLE 100 Definitions**

**Additions:**

**Risk Assessment.** An overall process that identifies hazards, estimates the potential severity of injury or damage to health, estimates the likelihood of occurrence of injury or damage to health, and determines if protective measures are required.

Informational Note: As used in this Standard, “arc flash risk assessment” and “shock risk assessment” are types of risk assessments. FR-4
**ARTICLE 100 Definitions**

**Qualified Person.** One who has demonstrated skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize **identify** and avoid the hazards involved. [70, 2011]

FR -24
ARTICLE 110
General Requirements for Electrical Safety-Related Work Practices
Has 39 First Revisions in this section

110.2(C) Employers shall document that employees required to respond to emergencies have received the training in (1) and (2) below:
(1) Contact Release. Employees exposed to shock hazards shall be trained in methods of safe release of victims from contact with exposed energized electrical conductors or circuit parts.
(2) Resuscitation. Employees shall be regularly instructed in methods of first aid and emergency procedures, such as approved methods of resuscitation, if their duties warrant such training. Training of employees in approved methods of resuscitation, including cardiopulmonary resuscitation and automated external defibrillator (AED) use, shall be verified annually.
FR -34
110.3 (F) Risk Assessment Procedure. An electrical safety program shall include a risk assessment procedure that addresses employee exposure to electrical hazards. The procedure shall identify the process to:
(1) Identify hazards;
(2) Assess risks; and
(3) Implement risk control according to a hierarchy of methods.

Informational Note No. 1: The hierarchy of risk control methods specified in ANSI/AIHA Z10-2012 is:
(1) Elimination
(2) Substitution
(3) Engineering controls
(4) Awareness
(5) Administrative controls
(6) Personal protective equipment
FR -45
# NFPA 70E 2015 Revision Cycle

## ARTICLE 120

### Establishing an Electrically Safe Work Condition

Has 9 First Revisions in this section

### 120.2 (B) (2) Training and Retraining

All persons who could be exposed shall be trained to understand the established procedure to control the energy and their responsibility in executing the procedure. New (or reassigned) employees shall be trained (or retrained) to understand the lockout/tagout procedure as it relates to their new assignment. The employer shall document that each employee has received the training required by this section. This documentation shall be made when the employee demonstrates proficiency in the work practices involved. This documentation shall contain the content of the training, each employee’s name, and the dates of the training. Retraining shall be required as the established procedure is revised. Retraining shall be performed at intervals not to exceed 3 years.

**Informational Note:** Content of the training could include one or more of the following: course syllabus, course curriculum, outline, table of contents or training objectives.
ARTICLE 130 Work Involving Electrical Hazards

Has 31 First Revisions in this section

Changes to sections:

130.2 (B)(3) Exemptions to Work Permits (reworded)
130.3 Work While Exposed to Electrical Hazards (reworded)
130.5 Arc Flash Hazards Analysis (restructured)
130.7(C)(15)(a) new
130.7(C)(15)(b) new
130.7(C)(15)(c) (was b new format)
130.7(C)(16) deletes PPE Category 0
### NFPA 70E 2015 Revision Cycle

**Table 130.7(C)(15)(a) Hazard/Risk Category Classifications and Use of Rubber Insulating Gloves and Insulated and Insulating Hand Tools—Alternating Current Equipment (Formerly Table 130.7(C)(9)**

<table>
<thead>
<tr>
<th>Tasks Performed on Energized Equipment</th>
<th>Hazard/Risk Category</th>
<th>Rubber Insulating Gloves</th>
<th>Insulated and Insulating Hand Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panelboards or other equipment rated 240 V and below Parameters:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum of 25 kA short circuit current available; maximum of 0.03 sec (2 cycle) fault clearing time;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>minimum 18 in. working distance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential arc flash boundary with exposed energized conductors or circuit parts using above parameters:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 in.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform infrared thermography and other non-contact inspections outside the restricted approach</td>
<td>0</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>boundary</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circuit breaker (CB) or fused switch operation with covers on</td>
<td>0</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>CB or fused switch operation with covers off</td>
<td>0</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Work on energized electrical conductors and circuit parts, including voltage testing</td>
<td>1</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Remove/install CBs or fused switches</td>
<td>1</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>
# NFPA 70E 2015 Revision Cycle

## Table 130.7(C)(15)(a) — Arc-Flash Hazard Identification (Note 1)

<table>
<thead>
<tr>
<th>Task</th>
<th>Equipment Condition — Note 2</th>
<th>Arc Flash Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform infrared thermography and other non-contact inspections outside the restricted approach boundary</td>
<td>Any</td>
<td>No</td>
</tr>
<tr>
<td>Reading a panel meter while operating a meter switch</td>
<td>Any</td>
<td>No</td>
</tr>
</tbody>
</table>
| Operation of a circuit breaker (CB), switch, contactor or starter   | • The equipment is properly installed;  
                           • The equipment is properly maintained;  
                           • All equipment doors are closed and secured;  
                           • All equipment covers are in place and secured; and  
                           • There is no evidence of impending failure  | No              |
| Work on energized electrical conductors and circuit parts, including voltage testing | Any                          | Yes             |
## NFPA 70E 2015 Revision Cycle

### Table 130.7(C)(15)(b) — Arc-Flash Hazard PPE Categories

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Category</th>
<th>Arc-Flash Boundary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panelboards or other equipment rated 240 V and below &lt;br&gt;<strong>Parameters:</strong> Maximum of 25 kA short-circuit current available; maximum of 0.03 sec (2 cycles) bolted-fault clearing time; working distance 18 inches</td>
<td>1</td>
<td>600 mm (2 ft)</td>
</tr>
<tr>
<td>Panelboards or other equipment rated &gt; 240 V and up to 600 V &lt;br&gt;<strong>Parameters:</strong> Maximum of 25 kA short-circuit current available; maximum of 0.03 sec (2 cycles) bolted-fault clearing time; working distance 18 inches</td>
<td>2</td>
<td>900 mm (3 ft)</td>
</tr>
<tr>
<td>600-V class motor control centers (MCCs) &lt;br&gt;<strong>Parameters:</strong> Maximum of 65 kA short-circuit current available; maximum of 0.03 sec (2 cycles) bolted-fault clearing time; working distance 18 inches</td>
<td>2</td>
<td>1.5 m (5 ft)</td>
</tr>
<tr>
<td>600-V class motor control centers (MCCs) &lt;br&gt;<strong>Parameters:</strong> Maximum of 42 kA short-circuit current available; maximum of 0.33 sec (20 cycles) bolted-fault clearing time; working distance 18 inches</td>
<td>4</td>
<td>4.3 m (14 ft)</td>
</tr>
</tbody>
</table>
### NFPA 70E 2015 Revision Cycle

#### Table 130.7(C)(15)(b) Hazard/Risk Category Classifications and Use of Rubber Insulating Gloves and Insulated and Insulating Hand Tools — Direct Current Equipment

<table>
<thead>
<tr>
<th>Tasks Performed on Energized Equipment</th>
<th>Hazard/Risk Category&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Rubber Insulating Gloves&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Insulated and Insulating Hand Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage batteries, direct-current switchboards and other direct-current supply sources &gt;100 V &lt;250 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parameters:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage: 250 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum arc duration and working distance: 2 sec @ 18 in.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work on energized electrical conductors and circuit parts, including voltage testing where arcing current is ≥1 kA and &lt;4 kA Potential arc flash boundary using above parameters at 4 kA: 36 in.</td>
<td>1</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Work on energized electrical conductors and circuit parts, including voltage testing where arcing current is ≥4 kA and &lt;7 kA Potential arc flash boundary using above parameters at 7 kA: 48 in.</td>
<td>2</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Work on energized electrical conductors and circuit parts, including voltage testing where arcing current is ≥7 kA and &lt;15 kA Potential arc flash boundary using above parameters at 15 kA: 72 in.</td>
<td>3</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>
# NFPA 70E 2015 Revision Cycle

Table 130.7(C)(15)(c)—Arc-Flash Hazard Identification for Direct Current (DC) Systems (Note 1)

<table>
<thead>
<tr>
<th>Task</th>
<th>Equipment Condition – Note 2</th>
<th>Arc Flash Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform infrared thermography and other non-contact inspections</td>
<td>Any</td>
<td>No</td>
</tr>
<tr>
<td>Reading a panel meter while operating a meter switch</td>
<td>Any</td>
<td>No</td>
</tr>
</tbody>
</table>
| Normal operation of a circuit breaker (CB), switch, battery disconnect switch, contactor or starter | • The equipment is properly installed;  
• The equipment is properly maintained;  
• All equipment doors are closed and secured;  
• All equipment covers are in place and secured; and  
• There is no evidence of impending failure. | No              |
|                                                                     | • The equipment is not properly installed;  
• The equipment is not properly maintained;  
properly maintained;  
• Equipment doors are open or not secured;  
• Equipment covers are off or not secured; or  
• There is evidence of impending failure. | Yes             |
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Next Steps:

- Final date for Receipt of TC First Draft ballot 2/8/2013
- Posting of First Draft and TC Ballot 1/18/2013
- Post Final First Draft for Public Comment 2/22/2013
- Public Comment Closing Date: 5/3/2013
- Second Draft Report Posting Date: 1/3/2014