

TechTopics Topic: NFPA 70E – Changes Expected in the 2009 edition

The next revision of NFPA 70E *Standard for Electrical Safety in the Workplace* is in the final stages of preparation and approval. The report of proposals (ROP) and decisions was released on 22-June-2007, with a deadline for comments of 31-August-2007. Review of comments will be conducted at a meeting in early October, and the report on comments (ROC) will be published on 22-February-2008. The 2009 edition of NFPA 70E is expected to be published in mid-2008.

Since the next edition is still in the revision cycle, the exact text of the 2009 version is not firm. However, the process is well along, and the preprint of the 2009 edition published with the ROP gives a pretty good idea of what the final document will say.

This issue of TechTopics gives a brief overview of upcoming changes as related to the Hazard Risk Category tables.

First, here's a bit of background regarding NFPA 70E. The Williams-Steiger Occupational Safety and Health Act was enacted in 1970, creating the Occupational Safety and Health Administration (OSHA). OSHA was charged with enforcement activities to foster safety in the workplace. OSHA initially used the National Electrical Code® (NEC, or more formally, NFPA 70) requirements in its enforcement activities, but soon realized that the NEC is an installation document and does not really address safety in any significant manner. OSHA also recognized that the federal regulatory process is slow, and therefore, requested that a new consensus standard on safety in the workplace be created. As a result, NFPA formed a new committee in early 1976 to create the document NFPA 70E. NFPA 70E was a logical adjunct to the NFPA 70 committee responsible for the NEC. The first edition of NFPA 70E was issued in 1979. The sixth edition of the document was issued in 2004, and the 2009 version will be the seventh edition.

NFPA 70E was created at the request of OSHA, and OSHA uses NFPA 70E in enforcement activities. OSHA does not technically enforce NFPA 70E, but OSHA looks favorably on safety programs that comply with NFPA 70E. Programs that do not conform to NFPA 70E face a burden of demonstrating that they have a valid basis for a safety program. This is a burden that most firms prefer not to bear.

Enough background – what about the upcoming changes?

The 2004 edition of NFPA 70E did not explicitly recognize the existence of arc-resistant switchgear, and the Hazard Risk Category (HRC) tables in the 2004 edition made no allowance for a lower HRC with arc-resistant switchgear. The expected 2009 edition, as contained in the preprint included with the ROP released in June, 2007, will explicitly recognize arc-resistant switchgear.

The HRC tables in NFPA 70E are only one method of determining the Hazard Risk Category for various activities, and actually are not the preferred method. The preferred method is to determine the incident energy at the working distance for various activities. This can be done with calculation methods in NFPA 70E, but more typically, the calculations are performed in accordance with IEEE Std 1584. The calculation methods in IEEE Std 1584 will most often (but not always) yield a lower Hazard Risk Category than the task tables in NFPA 70E. However, many users simply rely on the tables in the standard, as they have not performed the calculations of incident energy. It is for this reason that the upcoming changes to the HRC tables are highly significant.

The definitions in Article 100 in the 2009 edition will include the following definition:

**Switchgear, arc-resistant:** Equipment designed to withstand the effects of an internal arcing fault as indicated by successfully meeting the test requirements of IEEE Std C37.20.7. The following designations apply:

Type 1: Switchgear with arc-resistant designs or features at the freely accessible front of the equipment only.

Type 2: Switchgear with arc-resistant designs or features at the freely accessible exterior (front, back, and sides) of the equipment only.

The original issue of IEEE Std C37.20.7 was issued in 2001, and was titled "Guide for Testing Medium-Voltage Metal-Enclosed Switchgear for Internal Arcing Faults". The next edition of C37.20.7 is expected to be approved by the IEEE-SA Standards Board in late September, 2007, and will be published late in 2007 or early in 2008. The 2007 edition will further refine the test methodology of the 2001 document, and extends the document to cover not only medium voltage equipment, but also low voltage equipment. Because of the extension to cover low voltage equipment, the title is changing to "Guide For Testing Metal-Enclosed Switchgear Rated Up To 38kv For Internal Arcing Faults"

The following table provides a comparison of the Hazard Risk Category in the 2009 table.

Excerpt from **Table 130.7(C)(9) Hazard Risk Category Classification**

(source: NFPA 70E Report on Proposals A2008)

	Hazard Risk Category	
	Non-Arc-Resistant	Arc-Resistant (see Note)
Metal-Clad Switchgear 1kV -38kV		
Perform infrared thermography and other non-contact inspections outside the restricted approach boundary	3	3
CB operation with enclosure doors closed	2	0
Insertion or removal (racking) of CB		
doors open	4	4
doors closed	4	0
Opening VT or CPT compartments	4	4
Insertion or removal (racking) of VTs, doors closed	4	0

**Note:** Arc-Resistant Switchgear, Type 1 or 2 (For clearing times of <0.5 sec with a perspective fault current not to exceed the Arc-Resistant rating of the switchgear.

While not shown in the table above, the revisions also recognize a reduction in HRC for medium voltage NEMA E2 motor starters that have been tested in accordance with IEEE C37.20.7. For insertion or removal (racking) of starters of non-arc-resistant construction, the HRC is 4. For starters of arc-resistant construction with the doors closed, the HRC is 0.

As can be seen from the table, this revision will recognize a significantly reduced requirement for Personal Protective Equipment for certain operations involving arc-resistant switchgear as compared to the same operations with non-arc-resistant switchgear.

It must be recognized that arc-resistant switchgear is only arc-resistant when all doors and covers are closed and correctly secured. Whenever doors are open on arc-resistant switchgear, it is no longer arc-resistant, and therefore the HRC is the same as for non-arc-resistant switchgear.

I must caution that this summary is based on the preprint of the 2009 edition of NFPA 70E contained in the June 2007 Report on Proposals (ROP), and the language may be changed as the NFPA process moves forward. However, conversations with those involved with the NFPA 70E process suggest that it will likely be substantially as represented in this issue of TechTopics.

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