NFPA 70B — Recommended Practice for Electrical Equipment Maintenance Committee Report

CODE PANEL EEM-AAA

DESCRIPTION OF PANEL  This Committee shall have the primary responsibility for documents relating to preventive maintenance of electrical, electronic, and communications systems and equipment used in industrial and commercial type applications with the view of: (1) reducing loss of life and property, and (2) improving reliability, performance, and efficiency in a cost-effective manner. The purpose is to provide generally applicable procedures for preventive maintenance that have broad application to the more common classes of industrial and commercial systems and equipment without duplicating or superseding instructions that manufacturers normally provide. This Committee shall report to the Technical Correlating Committee of the National Electrical Code.

MEETING DATE  July 14-16, 2008
MEETING PURPOSE  Prepare a report on submitted proposals for the next edition of NFPA 70B

ATTENDEES:

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<tr>
<th>NAME</th>
<th>REPRESENTING</th>
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<tr>
<td>Mike Velvikis</td>
<td>NETA</td>
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<tr>
<td>Jim White</td>
<td>Shermco Industries</td>
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<td>Ron Widup</td>
<td>Shermco Industries</td>
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The Report on Proposals (ROP) was reviewed and balloted. There were 72 public proposals (including committee-generated prior to the ROP meeting) and 11 committee proposals (generated at the ROP meeting). The results were as follows:

NUMBER OF PROPOSALS 83

- Accept 35  Accept in Part 3
- Reject 8  Accept in Principle in Part 2
- Accept in Principle 35

Definitions:
- Accept – The panel accepts the proposal exactly as written. Only editorial changes may be made.
- Reject – The proposal is rejected by the panel.
- Accept in Principle – Accept the proposal with a change in wording.
- Accept in Part – If part of a proposal is accepted without change and the remainder is rejected. The panel action must indicate what part was accepted and what part was rejected and the panel statement must indicate its reasons for rejecting that portion.
- Accept in Principle in Part – This is a combination of “Accept in Principle” and “Accept in Part” as shown above.

MAJOR ISSUES:
- The chapters of NFPA 70B will be reordered for ease of flow in reading and to provide a more logical grouping of related topics.
- A new definition of commissioning was added to Chapter 3 to read as follows.
- Commissioning: A qualitative and quantitative process used to:
  - Develop procedures to verify and document functional system level and component level requirements
  - Develop a testing and operational tune-up (system and component final adjustment) plan
  - Determine and record baseline information for operation and maintenance procedures
- Evaluate initial system performance results and measurements
- Chapter 4 (Why an Effective Electrical Preventive Maintenance Program Pays Dividends), Chapter 5 (What is an Effective Electrical Preventive Maintenance Program), and Chapter 6 (Why an Effective Electrical Preventive Maintenance Program Pays Dividends) has been editorially revised for clarity of meaning, consistency of recommendations, updating to current terminology, correcting minor errors, and ease of flow in reading.
- Over the past couple of cycles, NFPA has received inquiries concerning emergency shutdown and restoration of electrical systems before, during, and after physical plant catastrophes such as industrial fires, floods, and severe weather-related problems as they relate to electrical systems. The addition (6.9 Emergency Preparedness and Electrical System and Equipment Restoration) of this new chapter focuses electrical maintenance activities toward the goal of safe and immediate shutdown as well as safe restoration of electrical systems. The information added provides a mechanism to prepare for these activities should it become necessary.
- Chapter 7 (Personal Safety) was revised to remove the details of personal protection and to refer the reader to the personal safety requirements of NFPA 70E. Other revisions were editorially updated for clarity.
- Chapter 8 (Fundamental of Electrical Equipment Maintenance) was revised for clarity of meaning, consistency of recommendations, updating to current terminology, correcting minor errors, and ease of flow in reading.
- Testing information was scattered throughout many chapters other than Chapter 21 (Testing and Test Methods), including Chapter 9 (Substations and Switchgear Assemblies), Chapter 10 (Power and Distribution Transformers), Chapter 14 (Insulated-Case/Molded-Case Circuit Breaker), and Chapter 29 (Grounding). Some of the material in Chapter 21 was not consolidated by type of equipment. In addition, there were several types of equipment which had no test information including switchgear, surge arresters, capacitors, emergency systems, automatic transfer switches, and circuit breakers. Other sections had indicated information, such as transformers, grounding, and relays. A number of updated references for additional information were added. This revision will improve the readability and completeness for the reader as well as provide current industry standard testing information.
- New section 17.10, Energy Efficiency of Motors, was added. The committee believes that use of energy efficient electric motors should be given serious consideration when replacing existing or installing new motors. The new material provided helps the reader to better justify the use of energy efficient motors.
- New Power Quality Audit section 27.11 was added. Part of an effective PM program for improved reliability is properly collected data that accurately reflects the present state of the system. Given the nature of power quality disturbances, a snapshot voltage reading of the system is not adequate; rather, an audit following the aforementioned procedure is necessary.

COMMENTS:
Fall 2009 Cycle
Comment Closing Date: 03/06/2009
Report on Comments Publishing Date: 08/28/2009

NETA RELATED ISSUES:
- Testing information, which was scattered throughout the chapters, was moved to Chapter 21 (Testing and Test Methods). Material in Chapter 21 was consolidated by type of equipment. This revised chapter includes the following types of equipment:
  - Low-Voltage Circuit Breakers (Insulated-Case/Molded-Case Circuit Breakers, Low-Voltage Power Circuit Breakers)
  - Transformer
  - Protective Relays
  - Grounding Systems
  - Batteries
  - Switches (Low-Voltage, Medium-Voltage, and High-Voltage)
  - Medium- and High-Voltage Circuit Breakers (Medium-Voltage Air Circuit Breakers, Medium- and High-Voltage Oil Circuit Breakers, Medium-Voltage Vacuum Circuit Breakers, SF₆ Circuit Breakers)
  - Infrared Inspections
  - Fuses
  - Insulating Liquid Analysis
  - Rotating Machinery
  - Cables (Low-Voltage, Medium-Voltage, and High-Voltage)
  - Adjustable Speed Drives
  - Switchgear and Switchboard Assemblies
  - Surge Arresters
  - Capacitors
  - Emergency Systems (Automatic Transfer Switches)
- Updated reference for each testing section in Chapter 21 to include NETA.
- The revision to Chapter 21 will improve the readability and completeness for the reader as well as provide current industry standard testing information and references.
Executive Summary

The sixth meeting of Z462 was held June 24 - 25, 2008, in St. John's, Newfoundland. A draft copy of the standard was released for public comment on April 6, 2008. This meeting addressed relevant comments received from the public during that 60 day period. Also during this meeting, existing subcommittees reported back to the TC on items that the subcommittees had taken action on.

Actions from the 6th TC Meeting

1. All relevant comments arising from the public review process were considered by the TC, with special relevance placed on comments received from the CEC Part I committee. Where the TC felt changes were warranted by the comments, changes were made. Many comments were considered and felt to be more relevant to a subsequent edition of Z462, not this initial edition.

2. A Task force was created to revise the existing 70E/Z462 differences document to reflect changes arising from this meeting and to add a column to the table of differences, giving the rationale for the CSA differences.

3. A Task force was created to review Table 4 of Z462, specifically the technical rationale for the hazard/risk levels specified in the Table. Liaison with the 70E committee will be part of the scope of work of this task force.

4. A final approval draft of the standard will be prepared by CSA staff following this meeting. Electronic balloting will be conducted for a 30-day period during the summer, with votes and comments to be considered at the next meeting of the TC, planned for September 10 and 11, 2008, in the Toronto area.

Background

The purpose of this project is to produce a Canadian version of NFPA 70E, Standard on Workplace Electrical Safety, suitable for publishing as a National Voluntary Standard of Canada, designated as CSA Z462. Z462 would be harmonized with NFPA 70E as much as practicable to the Canadian workplace, with the technical content staying similar while referencing specific requirements in the Canadian Electrical Code and other CSA safety standards. This project is necessary as NFPA 70E is becoming the de facto standard for workplace electrical safety across Canada. It does not mention the Canadian Electrical Code, the Control of Hazardous Energy Standard, Z460, or the Canadian live electrical work standards from ULC.

Previously Reported Work

At previous meetings, subcommittees and working groups were established, all with approved terms of reference. Approved material has been placed in the Z462 TC on-line workspace for use by committee members to publicize progress on the creation of this standard. Minutes of the previous meetings have been placed on the workspace as well.

Recently Completed Work

A draft of the proposed standard was released for public comment on April 6, 2008. All relevant comments from the public were considered, and changes were made where needed.

Future Work

A consensus draft will be prepared for final balloting. Balloting will be done on-line as an e-ballot for a 30-day period this summer. Ballots and comments will be reviewed at the next TC meeting.

A revised 70E/Z462 differences document will be ready for review at the next TC meeting.
IEEE has begun work on 20 new standards to create recommended practices for use in industrial and commercial power systems. All 20 standards projects are sponsored by the IEEE Industry Applications Society. The IEEE has approved work to begin to update a standard related to ac high-voltage circuit breakers. IEEE PC37.04-1999/Cor 1 (TM), IEEE Standard Rating Structure for AC High-Voltage Circuit Breakers - Corrigendum 1, corrects technical and other noneditorial errors made during the preparation of C37.04-1999 latest version, third printing 29 November 2005, which covers the rating structure for high-voltage circuit breakers rated over 1000 Vac.

IEEE has also approved a new standard, IEEE C37.43 (TM), Standard Specifications for High-Voltage Expulsion, Current-Limiting and Combination Type Distribution and Power Class External Fuses, with Rated Voltages from 1 kV through 38 kV, Used for the Protection of Shunt Capacitors. This standard establishes specifications for high-voltage (above 1000 volts) distribution and power class expulsion, current-limiting and combination type external capacitor fuses and accessories, with rated voltages from 1 kV through 38 kV, for protecting shunt capacitors complying with IEEE 18 (TM) and NEMA CP 1.