

IEEE SWITCHGEAR COMMITTEE CORRESPONDENCE

Minutes: IEEE High-Voltage Fuses Subcommittee
Place: Nashville, TN
Date: October 12th 2011
Presiding officer: John Leach - Chair
Recorder: Frank Muench - Secretary

MEMBERS PRESENT

G. Borchardt	S & C Electric Company
G. Haynes	ABB Inc.
J. G. Leach	Consultant - T&B/Hi-Tech Fuses
Chris Lettow	S&C Electric Company
Sean Moody	Mersen
F. J. Muench	Cooper Power Systems
D. Parker	Alabama Power
T. E. Royster	Dominion Virginia Power
Alan Yerges	Cooper Power Systems
J. Zawadzki	Powertech Labs Inc.

MEMBERS ABSENT

J. G. Angelis*	Consultant
R. L. Capra*	Consultant
D. Gardner^	Thomas & Betts – Hi-Tech
S. P. Hassler*	Cooper Power Systems
F. Ladonne*	Underwriters Laboratories
J. R. Marek^	Consultant
R. N. Parry	Cutler Hammer
R. Ranjan*	Consultant
M. Stavnes^	S & C Electric
J. S. Schaffer*	G & W Electric Co.

* Honorary/correspondence member ^ Excused

GUESTS

Nicholas Brusky	Eaton
Doug Fitchett	American Electric Power
Edward Jankowich	T&B
Harry Hirz	T&B
Frank Lambert	Georgia Tech/NEETRAC
Charles Worthington	Hubble Power Systems

- 1. Call meeting to order - at 1:30 PM**
- 2. IEEE Patent policy –** Presented and reviewed. Slides shown
- 3. Member /guest introduction –** 10 members 6 guests
- 4. Roster check–** roster circulated for correction. Sean Moody requested membership. Since he meets the requirements for membership we are pleased to accept him.
- 5. Approval of May 18th 2011 minutes –** Reviewed and approved without change.

6. Report from the Chair: Nothing to report

7. Standards status report: Attached as Annex "B". Summary:

- a. C37.48.1 balloted, reviewed and successfully recirculated with 100% acceptance – now in REVCOM for approval in December
- b. C37. 47 approved and being published
- c. All standards are up to date C37.40 – 2003 reaffirmed 2009

8. Working Group Reports

a. Revision of Fuse Specification Standards/Task force

- 1. C37.47 has been approved and is being published. All standards that were NEMA ratings documents and were moved to IEEE have now been revised, modified to bring them into compliance with IEEE Editorial requirements, and published (5 documents with one additional incorporated into C37.41) The working group has therefore completed its tasks and is disbanded.
- 2. Work has begun in the new task force on consolidation of C37.42, .43, .45, .46 and .47, to prepare for future PAR to put them together, but no meeting was held during these Switchgear Committee meetings.

b. Revision of Fuse Standards - J. G. Leach

- 1. Met Wednesday 10/12/2011 with 12 members and 1 guest
- 2. C37.48.1 status report was given – document has been submitted to REVCOM for December consideration. All negatives were addressed, so we had 100% approval, with 77 ballots – including 73 affirmative and 4 abstentions.
- 3. The future structure of our documents is still under consideration - the proposal at the end of our last meeting was for three documents in addition to application/tutorial documents:
 - I. Definitions (C37.40)
 - II. Testing (C37.41)
 - III. Ratings (combination of C37.42, 43, 45, 46, 47)
- 4. Work on bringing the standards C37.40 and C37.41 into compliance with the proposed consolidated Specification document will be needed, and a review was begun of additional possible new work. Possible changes therefore include:
 - 1) Changes to accommodate a combined specification document (including separation of designs that are additional to those covered by IEC - see Spring minutes)
 - 2) Changes to C37.40 altitude correction factors to reflect published C37.100.1
 - 3) Definition changes
 - 4) Incorporation of polymer cutout testing based on experience with polymer cutouts

There is recent/past IEC work that will also need to be moved into C37.40 & C37.41. The goal is for harmonization wherever possible

- 5) Motor starter surge and cycling tests
- 6) Liquid tightness tests (thermal cycling tests)
- 7) Changes to Capacitor Fuse testing based in changes to IEC capacitor fuse standard
- 8) Incorporation of surge durability tests for specific types of cutout link
- 5. The IEC maintenance group 3 is incorporating liquid tightness tests for transformer applications into IEC 60282-1. This testing is based on our liquid

tightness testing in C37.41. Changes have been necessary to better specify requirements for third parties (test stations). A proposal for changes was reviewed, and recommendations to MT3 will be made. The “improvements” can be reflected in our revision of C37.41 (see 4. above).

9. Report of liaison to other committees

ER&P Committee – J. G. Leach:

- a. Distinguished service award: proposed for Bill Long (well deserved)
- b. Working Group award: John nominated the Mark Stavnes led Working Group for Fuse Specification Standards, based on the total body of the work by the group, where one standard per year, over the last five years, were updated, balloted and published.
- c. Technical presentations are encouraged and should be part of the Subcommittee/Working Group meetings. An example of the IEC 60282-1 thermal cycle work was cited and felt to comply. E have also had presentations by Neetrac on Polymer Cutout testing at the WG ad Subcommittee level which also meets the intent of this proposal, that of better educating attendees.
- d. Proposal to identify 2 editors for Switchgear papers, rather than the 5 subcommittee chairs – Leslie Falkingham and Dean Sigmon have agreed to perform this function, and since the meeting, IEEE have accepted this solution (they had objected to 5 editors for a relatively small number of papers).

10. Report of IEC activities - J. G. Leach:

John reported on IEC activities - the full TAG report is attached as Annex “A”.

11. Unfinished business –

There was further discussion on the ultimate structure of our documents. There was general agreement, following on from the discussion of the Spring meeting that it was advantageous to make our documents look more like IEC fuse documents. We have always tried to adopt IEC testing where appropriate. However, document structure does not always match that of IEC very well. Our response to criticism that “IEEE” or “North American” fuses and practices were not “IEC” fuses and practices has been that our standards are regional variants in the same way that many countries adopt IEC standards but with “in country” variations to meet their specific needs (e.g. German VDE TCC curves or Australian brush fire considerations with expulsion fuses). To bolster this argument, and help get our variants recognized in the “parent” IEC standards, due to their widespread use (outside the area of North America), a “look” more like the “parent” IEC documents would help.

Upon further discussion it was unanimously agreed by all WG members that a single document containing both testing and specifications was desirable (IEC has testing and specification in the same document). It was recognized that combining all of C37.41 with C37.42, 43, 45, 46, 47, and parts of C37.40 would make a large standard, but that it would be much more convenient for the user.

A second discussion ensued when one member proposed that rather than combining all information into one document, there be two, one for CL fuses and one for expulsion fuses (as is done with IEC 60282-1 and IEC 60282-2). This would further make our standards more like IEC, but result in some duplication. After a period of debate, a show of hands demonstrated no consensus but rather more of a 50:50 split as to whether a single standard or two would be preferable. As a compromise it was proposed that we should look at a single document but divided into two parts, one for CL and the other expulsion. John Leach

volunteered to put together an outline to show what this would look like before our Spring meeting.

12. New business – None

13. Next meeting: Spring 2012: St. Pete Beach, FL, Tradewinds Island Grand Resort, (28th April-4th May)

Fall 2012: San Diageo, CA Catamaran Hotel (1 Oct – 4 Oct)

Spring 2013 Galveston Tx

Fall 2013 Los Vegas/San Antonio – tentative

Spring 2014 Disney, FL.

14. Adjournment – 2:30PM

Annex “A” IEC report

SC32A - U.S.A. T_{echnical} A_{dvisory} G_{roup}

Dr. John G. Leach, Technical Advisor ◆ j.g.leach@ieee.org ◆ 828-256-3744 ◆ Fax 828-322-2376

IEC Report 2011-2 October 2011



From: Dr. John G. Leach, Technical Advisor SC32A, October 10th 2011

IEC actions since May 2011:

Summary

There have been “official” IEC meetings of WG6 (Tutorial and Application Guide), MT3 (High-voltage current-limiting fuses) and MT7 (capacitor fuses) since the May report. A Committee Draft circulation of the revision of the Capacitor Fuse standard has been completed.

WG6

The committee draft of the new Fuse User’s guide was circulated on October 1st with a closing date of January 7th. Over 200 comments were received. Due to the size of the task of reviewing these comments, the convenor (Norbert Stein) and Secretary (John Leach) met in March 2011. Proposed comments and a new draft were circulated before the full WG (with 10 members present) met in Frankfurt May 30th – 31st 2011. Extensive changes were proposed for what was to be a second CD. A proposal to split the guide into two documents (tutorial and application) was rejected by a 8:2 vote. However better separation into the two parts was proposed, using a separate clause for each part (4 and 5) after required clauses on scope, references, etc. A second proposal was to split the document into two sections for current-limiting fuses and expulsion fuses (made by Germany who do not use expulsion fuses). This was also rejected as most countries used both types, often together. An individual country has the option of publishing the report with only the CL fuse sections. While IEC uses the term “breaking” where North America uses “interrupting” it was decided to use the term interrupting except when specifically referencing the defined terms that incorporate “breaking current”. Other proposals were to combine construction and operation subclauses, and produce tables describing different types of fuses. The aim is to have the second CD ready by December 2011. The next meeting will be held May-June 2012 to review the results of the second CD.

MT7

This group met under the convenorship of John Leach on September 11th 2011 in Maribor, Slovenia. The results of the CD, which closed July 22nd 2011, were reviewed. The only comments were from Brazil and related to perceived “omissions” in IEC 60282-2 and were not directly related to Capacitor Fuses. No changes were therefore proposed as a result of these comments. However, the Secretary of IEC SC32A, Didier Fulchiron, had several comments relating to the structure of the document. Most of these were “inherited” from the original standard. As a result a number of structural changes have been proposed. Since the changes can be considered “editorial” rather than technical, there appears no barrier to proceeding to a CDV (a Committee Draft Vote document cannot be substantially changed after circulation, if it receives the required percentage approval, so should not contain significant technical changes from the CD). The CDV will be circulated before May 2012 (probably January-February).

MT3

MT3 met in Maribor, immediately after MT7 on the 11th. The target date to finish the amendment to IEC 60282-1 was stated to be 2013. This would require a CD to be issued no later than April 2012 (although an earlier date is desirable). The two subjects to be covered by the amendment are liquid tightness tests for transformer applications, and clarification of the fuse voltage rating for three-phase circuits that are not “earthed-neutral”. Debate continued on the correct interpretation of the “switchgear type” liquid tightness tests and it was decided to include figures to make the test process clearer. Additional changes were also proposed to the “transformer type” application tests, as the IEEE method, on which it is based, tends to be rather vague. Additional figures for this test were also proposed. There was some controversy concerning the voltage rating issue. Didier expressed concern over the expansion of the “Standard conditions of use” section to contain “application” information and a discussion of systems with a non-earthed neutral. It was pointed out that while the scope of 60282-1 originally specified that it was for three-phase systems with an earthed neutral, this was removed at some point, so the basis for testing at only 87% of a system’s line-to-line voltage is no longer as obvious. As a compromise, it was proposed to move some of the added information to a note, referring to the application section of the standard.

Future meetings:

It was anticipated that another meeting of MT3, in conjunction with WG6 would be needed in the May-June period of 2012. This would be about 3 months after the CD of MT3 and 4 months after the second CD of WG6. Cologne or Düsseldorf were proposed as possible places for the meeting.

John Leach, 10-10-11

Annex “B”, October 2011

Document	Title	Sub-Committee	WG Chair	PAR	IEEE Status	Activity
C37.40	Standard Service Conditions and Definitions for High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Accessories.	HVF	John Leach 828 256 3744 j.g.leach@ieee.org		Approved 2003 R2009	None
C37.41	Standard Design Tests for High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Accessories	HVF	John Leach 828 256 3744 j.g.leach@ieee.org		Approved 2008	None
C37.42	Standard Specification for High-Voltage (>1000 V) Expulsion Type Distribution Class Fuses, Fuse and Disconnecting Cutouts, Fuse Disconnecting Switches, and Fuse Links, and Accessories Used with These Devices.	HVF	Mark Stavnes 773-338-1000, Ext. 2071 MStavnes@sandc.com		Approved 2009	None
C37.43	Standard Specifications for High-Voltage Expulsion, Current-Limiting and Combination Type Distribution and Power Class External Fuses, with Rated Voltages from 1kV through 38kV, Used for the Protection of Shunt Capacitors	HVF	John Leach 828 256 3744 j.g.leach@ieee.org		Approved 2008	None
C37.45	Standard Specifications for High-Voltage Distribution Class Enclosed Single-Pole Air Switches with Rated Voltages from 1kV through 8.3kV	HVF	Mark Stavnes 773-338-1000, Ext. 2071 MStavnes@sandc.com		Approved 2007	None
C37.46	Standard for High-Voltage (>1000 V) Expulsion and Current-Limiting Type Power Class Fuses and Fuse Disconnecting Switches.	HVF	Mark Stavnes 773-338-1000, Ext. 2071 MStavnes@sandc.com		Approved 2010	None
C37.47	Standard Specifications for High-Voltage (>1000 V) Current-Limiting Type Power Class Fuses and Fuse Disconnecting Switches	HVF	Mark Stavnes 773-338-1000, Ext. 2071 MStavnes@sandc.com		Approved 2011	None
C37.48	Guide for Application, operation, and Maintenance of High-Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches, and Accessories	HVF	John Leach 828 256 3744 j.g.leach@ieee.org		Approved 2005 R2010	None
C37.48.1	Guide for the Application, Operation, and Coordination of High Voltage (>1000 V) Current-Limiting Fuses.	HVF	John Leach 828 256 3744 j.g.leach@ieee.org	Approved 2009-13 Revision	Approved 2002 R2008	Submitted to RevCom for December 2011 consideration.