

IEEE SWITCHGEAR COMMITTEE

Minutes: IEEE High-Voltage Fuses Subcommittee
Place: Omni Hotel, Oklahoma City, Oklahoma
Date: Thursday, October 17, 2024
Presiding officer: Sterlin Cochran – Chair
Recorder: Jim Wenzel – Vice-Chair & Sec

VOTING-MEMBERS PRESENT (13)

Chris Borck	Eaton
Sterlin Cochran	G&W (SC Chair & Chair RFSWG)
Jeramie Cooper	Eaton
Gary Haynes	ABB Inc.
Travis Johnson	Xcel Energy
John Leach	Consultant/self-affiliated
Eric Li	PowerTech
Pete Marzec	S&C Electric Co
Carlos Nieto	S&C Electric Co
Caryn Riley	GT/NEETRAC
Randy Ward	Aluma-Form
Jim Wenzel	Eaton (Vice Chair & Sec)
Danish Zia	UL LLC

VOTING-MEMBERS ABSENT (6)

Brennen Fleming	Hubbell Power Systems
Chris Morton	Morton Consulting
Aaron Motes	ABB Inc.
Jon Spencer	Utility Solutions
Charles Worthington	Hubbell Power Systems
Jonathan Deverick [^]	Dominion Virginia Power

[^] correspondence only

NON-VOTING MEMBERS (6)

Dustin Sullivan	Hubbell Power Systems
Tim Anderson	Aluma-Form
Tim Tillery	Howard Industries
Chris Montanez	Merson
Harrison Metcalfe	Merson
Jason Jeter	Merson

HONORARY MEMBERS

John Angelis, L. Ron Beard, Glenn Borchardt, Ray Capra, Steve Hassler, Frank Ladonne, Chris Lettow, Jim Marek, Frank Muench, Don Parker, R. Neville Parry, Herb Pflanz, R (Kris) Ranjan, Tim Royster, John Schaffer, Mark Stavnes, Alan Yerges, Jan Zawadzki.

- 1. Call meeting to order** – 8:04 am (CDT)
- 2. Member/guest introduction** –. There were 13 members present, with 6 members not in attendance and 6 guests. With attendance at this meeting Eric Li and Carlos Nieto are now voting members of the HVF Subcommittee.

3. **Approval of Agenda** – The agenda was approved via motion from C Riley and Pete Marzec 2nd.

4. **Roster check** – Sign-in Sheet circulated.

5. **Approval of April 3, 2024 minutes** – The Spring 2024 minutes were approved by consensus.

6. **Report from the chair** –

- a. Sterlin reported on WG for C37.41. WG C37.41 met on Tuesday in 3 sessions and made great progress on resolving all comments from the second ballot. C37.41 has been resubmitted for approval. John will produce a clean version and a letter for copyright permission and submit to REVCOM. PAR for C37.41 will expire in 2024 and Sterlin will submit a PAR extension next week. We are on schedule and the request for PAR extension could be rescinded if we don't need it.
- b. C37.45 will expire in 2024 and a PAR needs to be started at the Fall 2024 meeting. We will need a chair for the C37.45 WG.
- c. C37.48 is active and published by IEEE but does not have ANSI accreditation. C37.48 will need a PAR for reaffirmation and a chair for the WG to republished where we request ANSI accreditation.

7. **Standards status report**

- a. C37.41: published April 2017, Corrigenda issued May 2017. Existing **PAR** for it to be combined with C37.42-2016, approved March 2020, expires Dec 2024.
- b. C37.42: published May 2017.
- c. C37.45: Published April 2017. (Needs to be updated by 2026)
- d. C37.48: New revision published August 2020. 2020 Does not have ANSI accreditation.

8. **Working Group Reports -**

- a. Revision of fuse standards – C37.41: Sterlin Cochran

The PAR for C37.41 expires December 2024 is on track to meet the requirements for that date. The WG agrees that we should request a par extension to mitigate any of the document not being after the next ballot.

The re-ballot had 13 comments. All were resolved in the meeting. The draft standard will have to be recirculated. The document will be circulated for 10days and submitted to RevCom.

9. **Report of liaison to other committees -**

- a. ER&P Committee – S. Cochran

1. Training Sessions

1. Feedback requested both good and bad to any subcommittee chair, or Karla
2. All Fall schedules will include an 'education' block

- b. T&I committee – Jeramie Cooper

1. 3 Topics Identified for Study

1. Microgrids and Inverters
2. NFPA 70B published in 2023
3. TRV Definition and Usage Throughout Switchgear Stds

a. Sterlin, Jeramie, Dustin

10. IEC Report – J. Leach – (full report Annex A)

- a. 2 online, 1 in person
- b. SC32A-MT6 Application Guide
 - 1. 2 online meetings, May and July
 - 2. Guide is currently obsolete
 - 3. Latest revision has been proposed to be published as a Technical Report
 - 1. IEC issued new rules in 2021 stating you cannot use “should”, “may”, “shall” in a Technical Report, thus a conflict now exists between the content and the Tech Report type
 - 2. Guide must be published as an International Standard
 - 3. IEC Standards different rules on Normative references and Informative references
- c. TC32-WG1 HV DC Fuses
 - 1. 1 in person meeting in October
 - 2. Both IEEE and IEC Groups had decided to ignore HV but the landscape is changing and voltages are increasing
 - 3. Low Voltage fuse standards
 - 1. Managed by UL in NA
 - a. Danish reported on latest from UL
 - 2. IEC had both Low Voltage and Miniature Fuse Standards
 - 4. Limiting DC voltages for Low Voltage rating
 - 1. G rated (full range) fuses 2.5kV
 - 2. A rated (backup) fuses 4kV
 - 5. Limited to Semiconductor, Photovoltaic and Battery fuses
- d. Multiple meetings held for JMT 441 reviewing IEC 60050-441 Switchgear, control gear and fuses.
 - 1. John represents fuses SC32A.
 - 2. Progress is slow with no participation from SC32B and SC32C.
- e. Team MT3 for CL fuses
 - 1. No technical activity.
 - 2. Dirk Wilhelm(Germany) is now the Convenor
- f. MT4 for IEC 60282-2 and 60282-4, waiting for our IEEE WG to finish the revisions to consider as changes to the 60282-2.
 - 1. Sterlin is Convenor
 - 2. Next meeting Paris, April 2025
 - 3. IEC had in the past taken the lead on cutouts from IEEE
- g. Next IEC Fuses meeting Paris, April 2025

11. Unfinished business – nothing to report

12. New business –

- a. Officer rotation: Sterlin and Jim finish 3-year term in Fall 2024.
 1. Jim will be Chair beginning in 2025
 2. Jim to appoint Vice-Chair
 1. Sterlin to be Vice-Chair
 3. Thank you to Sterlin for his service and organization for our Subcommittee
- b. Create WG for C37.45
 1. Motion made by Sterlin to create WG, Seconded by John.
 2. Motion carried by consensus
 3. Sterlin will be Chair
 1. Sterlin appointed Jeramie to be vice-chair

13. Future meetings -

- Spring 2025, (April 6th-11th) Wyndham Grand Orlando Resort Bonnet Creek, Orlando, FL
- Fall 2025 (October 5th – 9th) Peppermill Resort, Reno NV
- Spring 2026 (April 26th – 30th) Sheraton Sand Key Resort, Clearwater Beach FL
- Fall 2026 (October 4th-9th) Catamaran Resort, San Diego CA
- Spring 2027 (April 3rd-8th) Hyatt Regency, Orlando FL
- Fall 2027 Waikiki Beach, Hawaii

14. Adjournment – 9:16 am CDT

Submitted by Jim Wenzel, HVF Subcommittee Vice-Chair

Annex A

TC32/SC32A - U.S.A. Technical Advisory Group

Dr. John G. Leach, Technical Advisor ✉ j.g.leach@ieee.org ✉ 828-256-3744

IEC Report 2024-2 March 31st 2024 to October 13th 2024

From: Dr. John G. Leach, US Technical Advisor TC32 and SC32A, October 13th 2024

Summary

Since the March 2024 report there have been two on-line meetings of SC32-MT6 and an in-person meeting of TC32-WG1. A preliminary CC from the circulation of the CD produced by WG1 (HV DC fuse-links) has been made.

SC32A MT3 - HV current-limiting fuses

There has been no activity as there have been no requests for additions or changes to the documents covered by this MT (IEC 60282-1, and IEC 60644). The MT is scheduled to meet at the next plenary meeting (still unofficial, but planned for April 22nd 2025 in Paris).

SC32A MT4 - HV expulsion fuses

There has been no activity as the primary area for discussion is the Test Duty 4 changes to IEEE. When this has been finalized, information will be supplied to MT4 members and discussed at the next plenary meetings (still unofficial, but planned for April 23rd 2025 in Paris).

SC32A MT6

In response to the CD (32A/360/CD), a CC was prepared and circulated on 2024-04-19. Observations “to be discussed by the MT6” were addressed at on-line meetings on May 23rd 2024, and July 17th 2024. Resolving most of the comments required only modest effort. However, the primary cause of discussion and concern involved the requirements of the 2021 version of the IEC Directives Part 2 (Ed 9). In this it is made clear that only certain types of IEC documents can contain “guidance” and only certain types can be called “guides”. The title guide is reserved for a particular type ISO/IEC document related to international standardization, so our document title must contain only the word “guidance” rather than “guide”. The main problem faced is that it is no longer possible for a Technical Report (TR) to contain normative material, which is defined as “requirements...recommendations...or permissions”. Since a guidance document with no recommendations would be of little use (no use of “should” or its equivalents), the only viable document for us is therefore an International Standard (IS) (or its variants like a Technical Specification, TS). Since a TS is not meant to be a permanent document (it is used for a failed enquiry – e.g. CDV with insufficient support – or a matter still under technical development) we cannot use this. The problem with an “IS”, is that document references have to be requirements in the form of “shall” statements (e.g. “current rating shall be selected in accordance with X.Y of IEC XXXXXX:2024”). Guidance can seldom have requirements. One comment to the CD suggests that all references in the document be moved to a bibliography. While this seems logical (the bibliography is “informative”), the Directives require that the bibliography shall not contain “permissions or recommendations” so it would seem that we could not use a “should” in connection with a referenced document. This requirement (Directives 2, 21.2) is somewhat contradicted by the example in 21.5 that uses “should”! We are awaiting clarification on this from our Technical Officer. The next stage of the project is to request a new work item to create an International Standard for publishing our document, but we are presently unable to circulate the revised CC as we cannot respond to the CC comment on using Normative References or Bibliography entries. IEC report 2024-2.doc 2 The MT is scheduled to meet at the next plenary meeting (still unofficial, but planned for April 22nd 2025 in Paris).

TC32/WG1 HV DC fuses

The CD (32/265/CD) had a closing date for comments of May 17th, 2024. A substantial number of comments (approximately 175) were received, and a CC was issued 2024-07-12 with most comments being designated as requiring discussion by the WG. John Leach prepared discussion points to most of the comments and an in-person meeting was held in Velbert, Germany on October 8th – 10th 2024. Ten members attended from the US, Germany, UK, France, Slovenia, and Austria. Many of the comments (approximately 90%) were discussed, including certain fundamental issues involving the document (which continues to be somewhat controversial). An on-line meeting is planned for January 28th 2025 to finish examination of the comments. It is anticipated that a new CD will be prepared before the next in-person WG1 meeting, planned for the plenary meetings (April 23rd 2025). Significant decisions from the meeting are listed below: To the question as to whether the document should use primarily LV or HV structure and methods, it was decided to limit the voltage to 2.5 kV DC for type “g” fuses (full-range) and 4 kV

DC for type “a” fuses (backup). This limits the fuse types covered by the standard to “extended LV” fuse technology, and so testing requirements will be based on LV standards. The fuses will be limited to types used in low time constant circuits ($\leq 3\text{ms}$). The title will therefore be changed to “Fuse-links with DC rated voltage above 1,5 kV for the protection of DC circuits having a low time constant”. This will therefore limit applications to semi-conductor, photo-voltaic, and battery fuse-links. This will be stated in the scope. The standard will be limited to fuse-links so no dielectric requirements are needed (except for maximum arc-voltage requirements). An Annex discussing fuse-bases may be added. The previously agreed “modern” approach of testing fuses at their rated voltage (with tolerance only for testing convenience) will be maintained. The demonstration of rated current will be based on cycling tests at rated current as well as conventional fusing and non-fusing currents for “g” fuses, rather than temperature rise tests (which will be removed from the standard). It was felt that the above approach should deflect many criticisms from the “HV” fuse community as only specialist applications, at relatively low values of voltage, will be included. It is believed that the voltages will therefore be limited to values below those at which there is a fundamental change in the way LV and HV fuses behave (primarily at lower currents, where there is no significant current-limiting action). The Secretary of SC32B, Michael Altenhuber, who has been the primary person responsible for developing the DC fuse document is retiring from his IEC role at the end of 2024 and will be no longer take part in any IEC activities. While John Leach was listed as project leader for the project on the NP the technical leadership has come primarily from Michael. It is anticipated that his successor will continue to fulfill this role.

JMT 441

There have been no meetings of this joint maintenance team for the Electropedia section 441 (IEC 60050-441 Switchgear, controlgear and fuses). John Leach has been unable to achieve any input or participation from SC32B or SC32C. IEC report 2024-2.doc 3

TC21 CAG

The Chair’s advisory Group (chairs and secretaries of TC32, SC32A, SC32B, and SC32C) have not met but after expressing a desire to meet in Paris in Spring 2025, and initially being told that this would not be possible, further work has led to the anticipation of an official invitation to meet in Paris from April 22nd 2025 to April 24th 2025. An official invitation from the French NC is awaited.

Plans for future meetings – A plenary meeting of TC32, SC32A, SC32B, and SC32C (and their WG/MT) is anticipated for April 2025 in Paris, France.

John Leach, 10/13/2