

## IEEE SWITCHGEAR COMMITTEE

Minutes: IEEE High-Voltage Fuses Subcommittee  
Place: Hilton Burlington Lake Champlain  
Date: Wednesday October 19<sup>th</sup>, 2022  
Presiding officer: Sterlin Cochran – Chair  
Recorder: Jim Wenzel – Vice-Chair/Secretary

### MEMBERS PRESENT (10)

Chris Borck	Eaton
Sterlin Cochran	Oak and Shield LLC (SC Chair & Chair RFSWG)
Gary Haynes	ABB Inc.
Travis Johnson	Xcel Energy
John Leach	Consultant
Chris Morton	PowerTech
Caryn Riley	GT/NEETRAC
Jim Wenzel	Eaton (Vice Chair & Sec)
Charles Worthington	Hubbell Power Systems
Danish Zia	UL LLC

### MEMBERS ABSENT (5)

Glenn Borchardt	S&C Electric Co
Jeramie Cooper	Eaton
Jonathan Deverick <sup>^</sup>	Dominion Virginia Power
Jon Spencer	Utility Solutions
Randy Ward	Aluma-Form

<sup>^</sup> correspondence only

### GUESTS (7)

Mohit Chhabra	S and C
Brennen Fleming	Hubbell Power Systems
Eric Li	PowerTech
Aaron Motes	ABB Inc.
Carlos Nieto	S&C Electric Co
Dustin Sullivan	Hubbell Power Systems
Jen Santulli	IEEE SA

### 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** - 12:39 pm (EDT)
2. **Approval of Agenda** – The agenda was approved by consensus.
3. **Member/guest introduction** –. There were 10 members present, with 8 members not in attendance and 7 guests.
4. **Roster check** – Sign-in Sheet circulated.
5. **Approval of April 13<sup>th</sup>, 2022 minutes** – The Spring 2022 minutes were approved by consensus.

**6. Report from the chair** – Sterlin reported the C37.41 WG has continued progress on the revision but will need to extend the PAR expiring Dec 2024 out to 2026.

**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.
- d. C37.48: New revision published August 2020.

**8. Working Group Reports -**

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

Sterlin also reported WG meetings were held on October 18<sup>th</sup> at 10:15 am and continued October 19<sup>th</sup> at 8:00 am. October 18<sup>th</sup> had 19 in attendance with 11 members and 8 guests. October 19<sup>th</sup> had 20 in attendance with 11 members and 9 guests. A draft document (PC37.41\_D3b) had been produced and work continued reviewing the document.

Sterlin reported that on the 3 Task Forces (TF1 Disconnecting Devices; TF2 Dielectric Tests; and TF3 Test Series 4 for Cutouts) for revision of C37.41/42. Task Force 1 and 2 did not have any additional meetings between the spring and fall 2022 meetings. Due to a lack of proposals and apparent need of these task forces, they were disbanded. Task Force 3 meet a few times between the spring and fall, some progress was made with a summary of work presented to the working group. Their work will continue.

The PAR for C37.41 expires December 2024 and the WG will continue to work to that date. We may need to file for a PAR extension.

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

- a. ER&P Committee – S. Cochran: ER&P is looking for ways to improve engagement and for ways to communicate the value of attendance at Standards meetings.
- b. The T&I Committee is requesting participation from the Fuse SC. We will have to resolve the overlapping meeting times for both committees.

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

- a. The IEC General meeting will be in San Francisco October 29-November 2, 2022.
- b. The US TAG met in person to discuss the US position on low voltage designed fuses being applied at high voltages. See Annex A and notes WG2 for the details of the report.
- c. TC32/WG1 is working on a standard for DC fuses over 1500 V (the present limit for LV fuses). It is planned to cover all types of fuses (industrial, semiconductor, photovoltaic, and battery). Met online 6 times from May to September. Likely that permission will be given to launch a New Work Item Proposal later in 2022.
- d. WG2 for LV AC fuses rated > 1000V has been formed under the Fuse TC. SC32B will have to consider a scope change or work with SC32A to create a new standard to eliminate the overlap in scope.
- e. JMT 441 all definitions of IEC are combined in one document. 3 meetings were held to update the Fuse definitions.

**11. Unfinished business** – nothing to report.

**12. New business**

- a. T&I subcommittee would like input from all SC and in the case of overlapping with Fuse SC meetings someone should attend from fuses.

### 13. Future meetings -

Spring 2023(April 16 – 20), Sheraton Sand Key, Clearwater, FL  
Fall 2023 (October 08 – 13), Catamaran Resort, San Diego, CA  
Spring 2024, St. Petersburg, FL  
Fall 2024, Phoenix, AZ  
Spring 2025, Hilton Head, SC  
Fall 2025, Reno, NV

### 14. Adjournment - 2:30 pm

Submitted by Jim Wenzel, 12/09/2022

## Annex A

IEC report 32A-2022-2.doc

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

Dr. John G. Leach, Technical Advisor ♦ [j.g.leach@ieee.org](mailto:j.g.leach@ieee.org) ♦ 828-256-3744

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## IEC Report 2022-1 April 2022 to October 2022

From: Dr. John G. Leach, Technical Advisor TC32 and SC32A, October 11<sup>th</sup> 2022

### Summary

Since the April 2022 report there have been no SC32A maintenance team meetings, but on-line meetings of TC32/WG1/WG2 and the joint meeting JMT 441. Although there are meetings of SC32A and SC32B and their MTs, and TC32A and its CAG planned for the 2022 General Meeting in San Francisco (October/November) SC32C have decided not to meet at the General Meeting.

### **SC32A MT3 and MT6**

The next in-person meetings will be at the 2022 General Meeting in San Francisco. John Leach (convenor), and Sterlin Cochran and Jim Wenzel (members), will attend.

### **TC 32 CAG web meeting, May 17<sup>th</sup> 2021**

This meeting was scheduled in order to discuss, among other things, the TC32 Strategic Business Plan. On May 9<sup>th</sup>, Michael Altenhuber, secretary of SC32B, informed the members that the meeting was cancelled. The reason given was that a decision as to who was to represent the German DKE in San Francisco, and a decision on the SBP by the German National Committee was not to be made until the beginning of June, and therefore it should not be discussed by the CAG until then. The CAG meeting was not rescheduled, and so the US was not able to give any input. The final form of the SBP was agreed to by the Germans and Michael circulated this to the CAG on July 19<sup>th</sup> without further discussion. The main change to SC32B scope was the addition of the sentence "In special cases rated voltages can be increased up to and including 1 500 V AC and 2 000 V DC." (See WG2 below). However, the changes to the scope of SC32A proposed by AHG2: "Standardization of specific requirements for high-voltage rated above 1000V

AC) fuses designed for use on alternating current systems of 50Hz and 60Hz, for fuses primarily used in distribution systems and for special motor protection.” were not included. I immediately pointed this out to Michael and he said it would be changed before issuing the document. However, the draft SPB was circulated on September 16<sup>th</sup> without the change!

The reason that, in AHG2, I had pushed for the inclusion of “(rated above 1000V AC)” was to include the voltage that we use in all of our standards. In some countries the term “medium voltage”, is used for voltages over 1 000 V and less than some other value (not standardized, but generally around 100 000 V). Therefore, in some countries, “High voltage” fuses are used in systems of both medium voltage and high voltage, and it is quite common to refer to “medium voltage fuses” even though this is not strictly correct (at least as far as international standards are concerned). Adding a “definition” of high voltage, as applied to IEC and IEEE fuse standards, therefore clarifies this. However, including “(rated above 1000V AC) possibly makes it harder for SC32B to include 1 500 V AC fuses in its scope!

### **TC32/WG1 web meetings**

There have been a number of on-line meetings of this WG developing a standard for HV DC fuses. John Leach is a member of this group and they have been steadily working through a proposed document that combines several of the LV fuse standards for both industrial and semi-conductor fuses. The document is now essentially complete, and includes only DC fuses for circuits having a short time constant. It does however cover semiconductor fuses and fuses for battery and photovoltaic protection. A meeting of WG1 will occur in San Francisco.

### **TC32/WG2 web meetings**

This WG was to look at AC fuses of more than 1 000 V but designed as LV fuses. The first meeting, under new Convenor Viktor Martincic was on June 7<sup>th</sup>. It was stated that there were fuses on the market up to 10 000 V, but with most up to 2 500 V. It was thought that most were semiconductor fuses. Further inputs from manufacturers were to be sought and a second meeting held on June 27<sup>th</sup>.

There were two decisions from this WG meeting.

1. In light of the many semiconductor fuses in use and rated over 1 000 V, the proposal from the WG was to modify the scope of SC32B to allow for higher than 1000 V AC for semiconductor fuse-links. While this would not immediately address the requirements for fuse-holders or fuse-bases (which have to comply with 60269-1, a standard that only goes up to 1 000 V), this is of less immediate concern as often fuse-bases are not used with such fuses.
2. The second area of concern addressed by the WG are gG (“full-range”) fuse-links that currently exist tested to higher than 1 000 V AC). Some of these fuses have been tested to IEC 60282-1 but the majority have been tested to IEC 60269-1 (i.e. the LV standard). Of course, they have not been actually tested to the standard, as it does not apply to >1 000 V, and contains no arc-voltage requirements (or dielectric requirements for fuse-base/fuse-holders). However, the majority of such fuses appear to have a rated voltage of 1 200 V AC. They are needed for cable protection, so fuses tested to IEC 60282-1 may not be suitable. In order to have a standard that would be suitable for them, modification to IEC 60269-1 and 60269-2 to include them would seem to be a more sensible approach than either a brand-

new standard, developed by WG2, or changes to the HV fuse standards to accommodate the designs. It is therefore proposed to change the scope of SC32B to include AC voltages up to 1 500 V AC.

It may be noted that the final scope of SC32B, as produced by the German NC, did not meet the recommendations of the WG in that there is no mention of semiconductor fuses; ironically the present scope covers semiconductor fuses to any voltage over 1 000V, but the proposed scope would only be up to 1 500 V!

#### **JMT 441**

John Leach is a member of this joint maintenance team for the Electropedia section 441 (IEC 60050-441 Switchgear, controlgear and fuses). The aim is to bring up-to-date the definitions in this section. There have been three meetings (May 16, June 29<sup>th</sup>, and September 30<sup>th</sup>). There was some debate as to whether the directives suggestion (SJ.2.2) that only basic reference terms to be used by all committees should be included (which might require the removal of some specific terms) or whether we should continue to follow what is presently there. The latter course was decided upon. The next, on-line, meeting will be on November 15<sup>th</sup>.

#### **TAG Meeting**

John Leach has called for a face-to-face TAG meeting to discuss items for the General Meeting immediately after the IEEE HV Fuses Committee in Burlington VT, on October 19<sup>th</sup> 2022 (approximately 2:15 pm). Members of the SC32A TAG who are attending the GM should be at this meeting, together with everyone in SC32A TAG, but for the benefit of TC32 TAG members belonging to SC32B/C, an on-line meeting will be set up for the following week.

**Date and place of next IEC TC and SC32A meetings:** Meetings to be in San Francisco, 2022, in person only. SC32A/MT3 October 29<sup>th</sup>.

SC32A/MT6 October 29<sup>th</sup>, 30<sup>th</sup>.

TC32/WG1 October 31<sup>st</sup>.

SC32A November 1<sup>st</sup>.

CAG November 2<sup>nd</sup>.

TC32 November 2<sup>nd</sup>.

John Leach, 10/11/22