IEEE SWITCHGEAR COMMITTEE CORRESPONDENCE

Minutes: Working Group on Revision of Fuse Standards-C37.41, High-Voltage Fuse Subcommittee
Place: Burlington, VT
Date: October 18th - 19th, 2022
Chair: Sterlin Cochran
Secretary: John Leach

Voting Members Present on 18th (11)

Name	Employer/Affiliation
Chris Borck	Eaton
Sterlin Cochran	Oak & Shield LLC (Chair)
Gary Haynes	ABB Inc.
Travis Johnson	Xcel Energy
John Leach	-/Self (V-Chair/Secretary)
Chris Morton	PowerTech Labs
Aaron Motes	ABB–Hi-Tech
Caryn Riley	Georgia Tech/NEETRAC
Jim Wenzel	Eaton
Charles Worthington	Hubbell Power Systems
Danish Zia	UL LLC

Non-Voting members (Guests) (8)

Mohit Chhabra*	S&C Electric Co
Brennen Fleming*	Hubbell Power Systems
Danny Hoss	Southern States
Eric (Qian) Li	Powertech Labs
Carlos Nieto	S&C Electric
Sachin Pingle*	ABB Inc.
Jen Santulli	IEEE SA
Dustin Sullivan*	Hubbell Power Systems

*Now eligible for voting membership

Voting Members Present on 19th (11)

Chris Borck	Eaton
Sterlin Cochran	Oak & Shield LLC (Chair)
Gary Haynes	ABB Inc.
Travis Johnson	Xcel Energy
John Leach	-/Self (V-Chair/Secretary)
Chris Morton	PowerTech Labs
Aaron Motes	ABB–Hi-Tech
Caryn Riley	Georgia Tech/NEETRAC
Jim Wenzel	Eaton
Charles Worthington	Hubbell Power Systems
Danish Zia	UL LLC

Members not present	(11)
Brian Betts	Mersen
Glenn Borchardt	S & C Electric Co.
Jeramie Cooper	Eaton
Joshua Arlund	Maclean Power Systems
Rich Frye	Eaton
Pat Kula	Hubbell Power Systems
Jon Spencer	Utility Solutions
Jean-Mark Torres	Hubbell Power Systems
Bill Walter	We-Energies
Robert Wolf	Hubbell Power Systems

Non-Voting members (Guests) (9)

Anil Dhaniars	Alliers Groupe
Boubacar Diallo	Southern States
Brennen Fleming*	Hubbell Power Systems
Danny Hoss	Southern States
Eric (Qian) Li	Powertech Labs
Carlos Nieto	S&C Electric
Sachin Pingle*	ABB Inc.
Victor Savulyak	Kema
Dustin Sullivan*	Hubbell Power Systems

*Now eligible for voting membership

1. **Meeting Call to Order**
   The meetings were called to order on Tuesday October 18th at 10:15 am and again on Wednesday October 19th 2022 at 8:00 a.m.

2. **Approval of agenda**
   It was noted that because the Tuesday meeting had been added at short notice, the regular order of business would be followed on Wednesday while on Tuesday, only the examination of the latest draft of PC37.41 would be conducted. The extra meeting was added because the project is running approximately one year behind the PAR due to COVID delays. The agenda was therefore approved on Wednesday as circulated (proposed Jim Wenzel, seconded Chris Morton).

3. **Attendee introductions**
   Attendees were asked to sign in. It was pointed out that by signing in one agreed for IEEE to document your personal information for standards purposes, and additionally to have their e-mail information (if supplied) kept by John Leach for the purposes of communication (in the absence of an IEEE replacement for 123signup). Member introduced themselves – after the last meeting, Aaron Motes and Charles Worthington became eligible for voting membership and were welcomed.

4. **Approval of Wednesday April 13th, 2022, Orlando, FL minutes**
   The April minutes were reviewed and accepted as circulated.

5. Report from the Chair

Sterlin welcomed everyone and explained that the intent of the meeting was to move through the latest draft of the document, covering those sections for which input had been received and then to discuss any other points raised that needed discussion.

6. Report and Discussion of Relevant IEC activities – John Leach

John stated that there had been some activity relevant to the WG on LV fuses tested above 1 000 V AC but that a full report would be given at the Subcommittee meeting this afternoon.

7. Reports from the Task Forces

a) TF1, disconnecting devices (Cochran): Load break testing – it has been agreed to disband this group and return to the wording in the C37.41-2008 load break testing requirements.

b) TF2, Dielectric tests (Frye): Again, this group had not met, and it was agreed to return to the tables as used in the C37.41-2008 standard. For guidance on multi-pole arrangements, direction was being sought from Glen Borchardt, who had been unable to attend the last two meetings. The task force was disbanded.

c) TF3, Test Series 4 for cutouts (Hayes): the task force had 4 online meetings as well as a meeting Monday afternoon. Gary Haynes presented a brief outline of the possible approached being studied. It was agreed that the TRV be specified using the two-parameter approach as used in the IEC fuse standards and it is recommended that all of our TRVs be specified this way. It was agreed that the TRV values in C37.41-2016 corrigenda 1 do not match the available data. The TF will adjust the values. Work is still underway to better identify what the correct values should be for transformer through faults, based on current transformer designs. There is also concern that the typical test circuits used for the Series 4 test do not expose the fuse link to the same conditions as when the transformer is on the load side of the fuse. Two proposals are also under consideration by the TF. 1) return to the 2008 test series 4 method of testing cutouts, and 2) remove series 4.1 and 4.2 as being currents that are too high for normal transformer applications. It is hoped to have some better recommendations by the Spring meeting.

8. Revision of C37.41/42 – review of draft 3b

1) Changed submitted to the sections previously examined were reviewed (through subclause 9.2.) This included 1.6 interchangeability requirements where the wording from IEEE C37.42 was “softened” to indicate that, for many applications, the TCC requirements for K and T fuses did provide for interchangeability.

2) The subclauses following 9.2 were examined. Where the WG disagreed with suggestions raised by members not present, an explanation was inserted into the document as a comment. Suggestions for changes made at the meeting, and not previously circulated were left as “Track changes”. Unless members not present raise questions, and unless the writer of previous suggestions contacts the WG with counter comments, at the end of the year any changes made to the sections by the WG will be “accepted”, and the WG comment deleted ready for the next draft to be issued January 1st.

3) 12.3.3.1 (general of TCC requirements). Again, the wording was modified to recognize that K and T links “provides a level of time-current characteristic conformance sufficient to provide fuse interchangeability for many applications”.

4) 13.1 – it was decided that bolt torque tests should be for all types of insulators, and all devices.

5) 13.2.3 – it was decided that requiring devices to be in the same condition as 7.8 was unrealistic as it implies that various tests (e.g. “drop open”) might have to be performed. The wording “…substantially the same condition as before the test. There shall be no cracks in the insulators or loose hardware.” Was therefore used. Also, in the clause “device” replaced “fuse” as the device may be a disconnecting blade.
6) 16.1 General of Lightning surge withstand test. A comment by Jala was not understood. Still, the section was revised, and since he will no longer attend our meetings, his comment will be disregarded.
7) 18.1.1.4.3: Because of difficulty in cutting samples for the dye penetration test, the number of samples is reduced from 5 to 4, and a figure is to be added to show from where they are to be taken. The figure will show a sample location for each region of the fuse base.
8) The final subclause to be examined was 18.1.2.3 b).

The following items from the last meeting are still outstanding:

9) It was determined that table 21 “Homogeneous series test requirements for expulsion fuses that use replaceable fuse links, fuse units, or replaceable refill units” is confusing. **John Leach** will attempt to clarify this. [This has been addressed in the next draft].
10) There was some discussion of definitions, particularly related to “switches” and “disconnecting” devices. A request was made for someone relatively new in our industry to look at our definitions critically, as many of us know what is meant and do not recognize the difficulty for others with less experience. **Brian Betts** volunteered to do this.
11) The review list is shown below with reviewed sections removed (some members, who have already fulfilled their tasks, are blank – but are welcome to review any other areas that have not yet been reviewed!) Some areas may have been reviewed but with no comments – please let John Leach know this so it can be removed from the “to do” table:

Joshua Arlund	
Brian Betts	Annex J, 3
Glenn Borchardt	8, TS4
Chris Borck	
Sterlin Cochran	Annex J, Annex K, TS4
Jeramie Cooper	18, TS4
Rich Frye	
Gary Haynes	TS4
Travis Johnson	20, 21, 22, Annex G, Annex H, TS4
Pat Kula	
John Leach	
Chris Morton	TS4
Caryn Riley	18, Annex B, C, D, E, F, TS4
Jon Spencer	
Jean Mark Torres	
Bill Walter	20, 21, 22
Jim Wenzel	Annex I, TS4
Robert Wolf	

Charles Worthington	
Danish Zia	TS4

Please feel free to review other sections than “your” section.

8. Old Business

None

9. New Business

None

10. Next meeting

Spring 2023, (April 16-20) Sheraton Sand Key, Clearwater Beach, FL
Fall 2023 (October 08 – 13), Catamaran Resort, San Diego, CA
Spring 2024, St. Petersburg, FL (in negotiation)
Fall 2024, Phoenix, AZ (in negotiation)

11. Adjournment: motion to adjourn, proposed Caryn seconded Jim and approved unanimously at 12:00 noon October 19th, 2022

Respectfully Submitted,
John Leach, Secretary (11/15/22)