

## IEEE SWITCHGEAR COMMITTEE CORRESPONDANCE

Minutes: IEEE High-Voltage Fuses Subcommittee  
Place: San Diego, CA  
Date: Wednesday, October 9<sup>th</sup> 2019  
Presiding officer: Jim Wenzel– Chair  
Recorder: John Leach – Vice-Chair/Secretary

### MEMBERS PRESENT

Chris Borck Eaton  
Sterlin Cochran Oak and Shield LLC  
Gary Haynes ABB Inc.  
John Leach Consultant (Sec.)  
Chris Morton PowerTech  
Jon Spencer Utility Solutions  
Jim Wenzel Eaton (Chair)  
Randy Ward Alumaform  
Charles Worthington Hubbell Power

### MEMBERS ABSENT

Bobby Moorhead Dominion  
Rodolfo Elizondo Peak Demand  
Jonathan Deverick^ Dominion Virginia Power  
^ correspondence only

### GUESTS

Joshua Arlund MacLean Power Systems  
Jeramie Cooper Eaton  
Rich Frye Eaton  
Hermanth Jala S&C Electric Co  
Travis Johnson Xcel Energy  
Brendan Kirkpatrick Southern California Edison  
Pete Marzec S&C Electric  
Paul Pearce MacLean Power Systems  
Caryn Riley GT/NEETRAC  
Robert Wolf Hubbell Power Systems

### 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 - 1:30 pm**

**2. Approval of Agenda** – SC members for the Technology and Innovation SC and SC37.100.1 were added to the agenda.

**3. Member/guest introduction -**

a. 9 members, 9 guests

**4. Roster check** – Sean Moody and Brad Lewis have resigned from the subcommittee.

**5. Approval of May 1<sup>st</sup> 2019 minutes** – There were no corrections to the Fall meeting minutes and they were approved as circulated.

**6. Standards status report**

- a. C37.40: made obsolete with the latest C37.41 and C37.42, but still shown on IEEE site as active – a solution is being sought.
- b. C37.41: published April 2017, Corrigenda issued May 2017.
- c. C37.42: published May 2017.
- d. C37.45: Published April 2017.
- e. C37.48: under revision, to be completed 2020.
- f. C37.48.1: being incorporated into revision of C37.48.

**7. Working Group Reports -**

a. Par Study Group – S Cochran

Sterlin reported that the PAR study group had met on Tuesday October 8<sup>th</sup>, with 20 persons present. Jim Wenzel opened the meeting as SC Chair, and he and John Leach gave the background concerning long term plans of the SC to combine C37.41 and C37.42 in one document and the timing requirements for standards revision. The history of C37.41-2016 and the Corrigendum were also discussed. There is presently a request to NEETRAC to study TRV values on typical systems concerning Series 4 for cutouts, the outcome of which might have a bearing on the revision. After a general consensus that the project to combine C37.41 and C37.42 should go ahead, a request for a Chair was made and Sterlin volunteered. There being no other candidates, Sterlin Cochran was appointed the Chair of The Revision of Fuse Standards Working Group – C37.41, to take effect when the PAR is approved. John Leach agreed to assist as Secretary/Vice-chair.

Sterlin then led the meeting to develop the PAR proposal. The Study Group passed a motion to request that the Subcommittee authorize the application for a PAR before the next SC meeting in May 2020. This motion, needing no second as it came from the PSG, was passed unanimously.

b. Revision of Fuse Standards – J. Leach

- 1. The Working Group met on October 9<sup>th</sup>, 2019 at 8 am. There were 14 of 20 members and 14 guests, three of whom are now eligible for membership.
- 2. The chair reported that the ballot of PC37.48 resulted in an 84% return rate, 92% affirmative, 5 negative votes, and 120 comments.
- 3. The WG discussed the ballot comments to PC37.48 and recommended a variety of minor changes to the document. A few comments will require additional inputs from members and IEC colleagues.

4. Since approval of IEC 60282-1 Ed 8 (soon to be circulated as an FDIS) is needed in order that PC37.48 can reference it, and a number of ballot comments will take additional work, an immediate recirculation will not be possible. However, it is anticipated that the recirculation should take place by the Spring meeting. Whether any meeting time will be required in the Spring depends on whether there are additional comments to the changes, but it is likely that further meetings will not be required, and this may have been John's last meeting as Chair (after 25 years as RFS Chair).

#### **8. Report of liaison to other committees -**

##### **a. ER&P Committee – J. Wenzel**

1. There is still, as usual, a push for more papers as Switchgear committee publish a small number of papers for its size. A seminar on how to write a paper is proposed.
2. It is proposed that each subcommittee produce a poster, for publicity purposes, describing SC activities. A standardized format has been produced.
3. A mentorship program is proposed for SC and main committee officers to assist new officers navigate the complexities of IEEE procedure.

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

- a. Since the May 2019 report there have been two SC32A maintenance team meetings, one in Lyon France (MT3 and MT6) and the other in Greece (a brief joint MT3/6 meeting).
- b. MT3 (Maintenance Team 3, Current Limiting Fuses)
  1. The amendment to IEC 60644 has been published.
  2. IEC 60282-1 Ed8 Has had a revised RVC (report of voting) issued as a result of decisions made in Lyon concerning comments to the CDV. The FDIS is being processed by Central Office, and should be circulated within a maximum of 4 months.
  3. The MT has issued a statement concerning the higher contact temperature rises permitted by Switchgear. There are no plans to revise fuse temperature rises.
- c. WG8 (Working Group 8, Expulsion Fuses with Polymer Insulators)
  1. The RVC for the CDV was issued July 19<sup>th</sup> 2019 and the FDIS is being processed by CO.
- d. Next meetings it is anticipated that MT3 and MT6 will meet in Paris, France at a plenary meeting of TC32, SC32A and, hopefully, SC32B and SC32C. The dates are September 14<sup>th</sup> – 18<sup>th</sup> 2020.

#### **10. Unfinished business – none**

#### **11. New business – Members for the Technology and Innovation Committee and the WG for revision of C37.100.1**

- a) The T&I subcommittee are tackling subjects to include aging equipment, application of switchgear tested to IEEE but used for non-covered applications, and the impact of inverter-based technology on switchgear. Three initial members from each subcommittee are to be appointed, and the further members will be added through the

normal process. Volunteers were sought and Charles Worthington, Jim Wenzel, and Sterlin Cochran all agreed to serve.

- b) While the “common clauses” switchgear document C37.100.1 has limited application to fuses, it is advisable for at least one of our members to attend, at least occasionally, to ensure nothing gets put that would be detrimental to our fuse standards. At the moment their meeting clashes with our Revision of Fuse Standards meeting. However, we will have some flexibility in the future to use either Tuesday or Wednesday for our meeting. Gary Haynes and Travis Johnson both agreed to monitor the C37.100.1 activity and report back.

**12. Future meetings -**

Spring 2020 (May 4<sup>th</sup> – 8<sup>th</sup>) Peppermill Resort, Reno, NV

Fall 2020 (Oct 4<sup>th</sup> – 8<sup>th</sup>) Sheraton Sundance Square, Fort Worth, TX

Spring 2021 (April 18<sup>th</sup> – 23<sup>rd</sup>) Hilton Charlotte University Place, Charlotte, NC

**13. Adjournment - 2:30 pm**

Respectfully Submitted,  
John Leach, Secretary

## Annex A

# 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 ✉ Fax 828-322-2376

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## **IEC Report 2019-2 May 2019 to October 2019**

From: Dr. John G. Leach, Technical Advisor TC32 and SC32A, October 23<sup>rd</sup> 2019

### **Summary**

Since the May 2019 report there have been two groups of SC32A maintenance team meetings. The amendment to IEC 60644 has been published, and the FDIS documents for IEC 60181-1 Ed8 and the new IEC 60282-4 have been prepared and are being processed for circulation, which may occur before the end of the year, or early in 2020.

### **Meetings:**

Both MT6 (IEC TR 62655, Tutorial and guide) and MT3 (current-limiting fuses) met in Lyon, France on June 6<sup>th</sup> and 7<sup>th</sup>, 2019. There were six members present. MT3/6 again met briefly after the ICEFA in Athens on September 17<sup>th</sup> 2019, with 9 members present.

### **MT3 – “current-limiting fuses”**

IEC 60644 the amendment was moved directly to IS (international standard) stage on May 3<sup>rd</sup> 2019, without further vote after the CDV. This document was published on September 23<sup>rd</sup> 2019.

IEC 60282-1 Ed 8: The report of voting on the CDV (termed RVC) was issued May 17 but with three comments left for discussion by the MT during the meeting in France. Additional comments had been sent by Mexico, and these, together with the unresolved comments, were discussed in Lyon. This resulted in a revised RVC (32A/344A/RVC) which was circulated 2019-08-09. The FDIS was prepared at the meeting but left a question from the editor unanswered, whether the latest versions of IEC 60085 (2007)

“Electrical insulation – Thermal evaluation and designation” could be referenced. It was discovered that from Ed. 5, or earlier, for Table 6 Class A insulation “immersed in oil”, the maximum temperature was reduced from 105 °C to 100 °C. It was assumed this was due to the presence of oil (the switchgear “common clauses” document specifies 100 °C for parts in oil, other than contacts), so it was decided to reference the latest version but change the table note to “Classes generally according to IEC 60085”, as it was not felt that, at this stage, we should consider any other change. The FDIS was submitted 201908-09. Presently it has been translated and is in editing check. It is scheduled to be registered as an FDIS on October 16<sup>th</sup>. Circulation as an FDIS should follow this date, but the timing is uncertain (a maximum of four months).

Contact temperature rises: IEC fuse standards generally reflect the temperature rise limits used by Switchgear. The maximum temperature for contacts in IEC Switchgear standards have a 10 K higher value than the fuse standards. During the ICEFA 2019 Juan-Carlos Perez-Quesada led a round table discussion after a presentation. He is concerned that

allowing the fuses to run hotter, at least in a canister, could lead to problems for some equipment. After discussion, MT3 had a brief meeting, primarily to formulate a statement concerning temperature rises. The statement was “Having considered some of the potential effects that an increase in permitted fuse contact temperature rise/maximum temperature could have on the satisfactory performance of fuses and associated fusebases or canisters, MT3 do not feel that it would be appropriate to make any changes at this time, or in the immediate future, to the maximum temperature rises specified in IEC 60282-1.”

#### **WG8 – “Polymer cutout standard”**

IEC 60282-4 (polymer insulator document): To resolve some of the comments to the CDV (which closed on January 18<sup>th</sup>) a teleconference was held on July 3<sup>rd</sup>. As a result, the RVC (32A/345/RVC) was circulated on July 19<sup>th</sup>. The draft FDIS was submitted on August 19<sup>th</sup>. Presently it is in translation (to French) and the next stage, editing check, is due October 11<sup>th</sup>. Registration as an FDIS should be approximately two weeks later.

#### **MT6 – “Tutorial and Application Guide”**

A formal project for the revision of IEC TR 62655 has not yet been started. However, a meeting of MT6 was held in Lyon, France on June 7<sup>th</sup> to start looking at the changes that will be necessary to reflect the changes in IEC 60282-1 Ed 8. Many of the changes made in the IEEE “version” (C37.48) will also be reflected in the revision. It is anticipated that a formal project will be opened after the SC32A plenary meeting (see below).

**Other business:** The fuse committee/subcommittees have not been invited to the 2020 IEC General meeting in Stockholm. As a result, France have invited all of the fuse groups to meet in Paris September 14<sup>th</sup> - 18<sup>th</sup> 2020. The request is that all subcommittees and MT/WG meet in Paris to help maintain the viability of all groups. It was agreed at the Athens meeting that, in view of the present workload, it will not be necessary for MT3 or MT6 to meet before the Plenary meeting in September 2020. As a future work item, the suggestion for a new document to address standard dimensions for transformer fuses will need a NWIP (new work item proposal) from a National Committee. While such a project could be launched from a plenary meeting, from a subcommittee activity point of view, an NWIP looks much better. Germany will investigate this.

**Date and place of next meetings:** SC32A, MT3, and MT6 will meet in Paris, France September 14<sup>th</sup> – 18<sup>th</sup> 2020. John Leach plans to attend and would welcome other members of the TAG to join him. He also urges other members of the HV fuse community to consider joining the US IEC TAG for SC32A (and TC32). John Leach, 10/03/19