C37.74 Working Group Meeting Minutes

April 2nd and 3rd, 2024, Westin Beach, Fort Lauderdale, Florida

Chair: Kennedy Darko

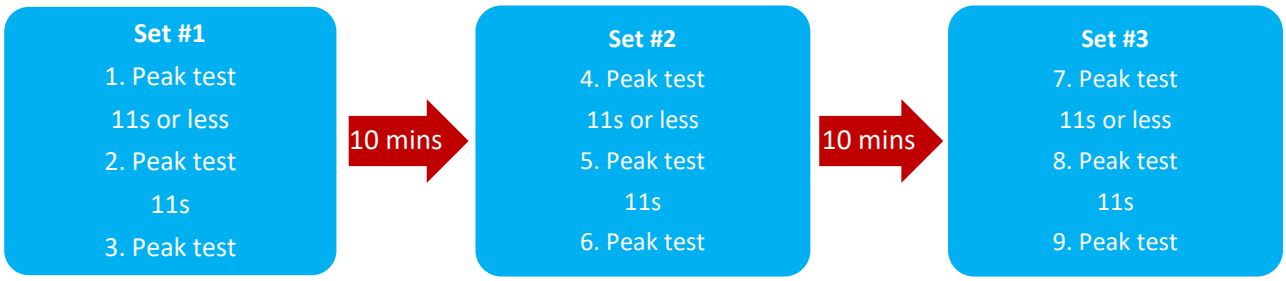
Secretary: Travis Johnson
Frank DeCesaro – Filling in

Meeting Minutes

1. Call to Order At 8:05 AM EDT
2. Call for Patents and Copyrights.
   i. Patent Slides –

      No issues presented by members.

   ii. Copyright Slides – *No issues presented by members.*
3. Introduction of Members and Guests
4. Attendance and quorum check
   i. *We had (15) of (19) voting-members present so we have a quorum.*
5. Approval of agenda
   i. *Francois moved to approve, and Karl Trost seconded. Agenda approved*.
6. Approval of previous meeting minutes
   i. *We had (3) meetings since the fall meeting. Minutes had been sent out by the chair prior to this meeting.*
   ii. *Ian moved and Joe Stemmerich seconded. Minutes approved as submitted.*
7. Action Items
   - Ballot comment resolution (see attached spreadsheet)
     - *7.7.4.3 Peak Withstand Test Comment (I-488, line 1061; I-489, line 1071; I-490, line 1073, I-378, line 1073; I-379, line 1075; I-491, line 1078; I-546) – Chair displayed a presentation.*



- *A table showing what C37.71, C37.72, C37.73, and C37.74 had regarding the value of the first peak current was displayed and explained by Mohit Chhabra. Chair stated we will get back to this.*

Some question from the floor:

- *Do we go to four shot sequences or stay with three?*
  - *The chair noted that the subclause states purpose is to simulate typical reclosing and does not necessarily refer to a recloser, It is to simulate reclosing in the system. Which doesn't have to be a four-shot sequence.*
- *What does partial overhead lines mean?*
  - *You have an overhead line that will have underground taps off it. One utility stated that 99% of their circuits are like this.*
- *There was general agreement in the meeting that test has a historical basis but seems It is onerous as it is.*
  - *A suggestion was made to stay with three tests for now. Add a statement stating why a three-shot sequence is acceptable.*
  - *Vote: All who think the current statement is good enough. (14) members yes, (1) abstention.*
- *I-489, Line 1071 – if it is a recloser then change the 11s more to an actual typical interval 0.5x-2s-2s-*
  - *Should we more precisely simulate a recloser or leave it as a 3 x3 that we have. Resolution is that the standard as it is written does not stop the manufacturer from testing like this. We will not change it.*
- *I-546 and I-379 are related. – item (d) dealing with the peak current in outer phase shall start with a major loop, and the peak of the major loop shall not be less than the rated peak withstand.*
  - *First commenter d1: Each current surge in one outer phase shall start with a major loop, and the peak of this major loop shall not be less than the rated peak withstand current (See subclause 5.7 and Table 3 and Table 4 for preferred ratings.)*
  - *Second commenter d2: change to say "first peak of each set shall be on different phases each time. So, per diagram above Peak 1 on A, Peak 4 on B and Peak 7 on C. The rest of the operations for each set are then random.*
  - *Third commenter d3: The peak current of the first current surge of each set shall be applied in an outer phase with the current in the other outer phase starting with a major loop. The remaining current surges of each set may be initiated with random closing.*
- ***Discussion** on the meaning of peak on one outer phase and the major loop on the other outer phase, the associated physics of which phases see the most electromagnetic forces depending on which phase sees the first peak. It was noted*

that to get the peak on the outer phases with a major loop on the other outer phase, the peak had to be always applied to phase C.

- *Vote on sequence. Three scenarios created out of the comments and voted on.*

  ***Scenario 1**: Peak always controlled on outer phase A or C for all 9 shots. Phase B is not tested for max peak. (4 votes)*

  ***Scenario 2**: A, B, C always each see three controlled peaks. (9 votes)*

  ***Scenario 3**: A, B, C each see one controlled peak. The next two peaks in the set will be by random closing and can fall on any phase. (2 votes)*

  We Re-Voted on all Scenarios per the wording above and revoting and scenario 2 was declared the winner.

- *We will remove the comment about the current in the other outer phase shall start with the major loop. No one objected.*

- MEETING SESSION TWO

  - *Session #2 started began at 10:16 AM EDT. The session continued with ballot comment resolution. The chair asked newcomers to identify themselves. We had (3) newcomers. We have (15) voting members, so we do have a quorum.*

  - *I-491, Line 1078 Clause 7.7.4.3. The average rms symmetrical component of the current at the tenth cycle shall not be less than the rated short-circuit withstand current.*

    - *The comment stated that it is not always possible to maintain this.*

    - *Like a short-time test in the other standards, you have the Peak and then ring down.*

    - *When performing fault making, the standard states that after the 10th cycle the average rms symmetrical current shall not be less than 80% of the rated short circuit current.*

    - *The chair does not see a problem with this. It is ok with fault making so peak withstand should be also. WG accepts.*

    Multiple comments on visible break started with "The term visible break is incorrect" and a challenge to the definition of visible break.

    I-669; I-668; I-518; I-671; I-655; I-672; I-674; I-675; I-90; I-676; I-576; I-662; I-585; I-664; I-587; I-572; I-94; I-657; I-577; I-515 –Recommended to change visible break to disconnecting or isolating switch.

- *A commentor suggested adding dielectric requirement to visible break in line with one of the definitions presented to ADSCOM by the visible break task force. There was some debate on the definition, a commenter asserted that the current definition in the standard is not what was presented to ADSCOM. Francois Soulard who presented to ADSCOM couldn't locate the final document because of company email clearance policy.*

- *The visible break intended for C37.74 equipment that utilizes vacuum interrupters, which do not provide visible open state.*

    - *C37.74 clause 6.13 gives some background information on the visible break.*

    - *One commenter suggested that if a visible break is closed it does not meet its definition. It is not a break.*

    - *It was pointed out that the ADSCOM minutes from fall of 2018, item 21 Task Force: Visible Break, stated.*

        - *Motion from group is to dissolve this group.*
        - *Handing definition over to various WG's and S/C's*
        - *Unanimously approved.*

    - *The Chair suggested to keep the definition and add qualifiers for easier interpretation of what visible break is.*

    - *A commentor asserted that there were other comments like the visible break being in the same phase during the ADSCOM debate that was not addressed.*

    - *Summary minutes from ADSCOM Spring of 2018*

    Visible break. A draft definition for visible breaker was established. The task force requests approval to move forward with use of and implementation of definition.

    Definition slide was presented.

    Visible break – a gap between conductors that can be visually verified, and meets the dielectric withstand requirements in the relevant product standard.

    Discussion:

        Discussion of isolation dielectric versus service dielectric requirements raised.

        Francois: Agreed to distribute definition to ADSCOM members requesting additional review and comments to address this issue.

        Thus, for now, no further actions at this time.

- *Go back to ADSCOM with this definition: It was suggested that going back to ADSCOM was not necessary and that the WG has already been empowered to proceed.*

  Revised definition presented: Visible break – a gap between conductors that can be visually verified, and meets the dielectric withstand requirements in the relevant product standard.

  Karla Trost and Francois Soulard will fine tune the wording after looking at other minutes today and present to the C37.74 meeting tomorrow.

  Karla Trost will request ADSCOM to amend their minutes from Fall of 2018 to catch the items regarding phase.

- *All in favor of adapting the following definition: (10) for (1) against (2) abstentions.*

  Visible break – an insulating gap between conductors that can be visually verified, and meets the dielectric withstand requirements in the relevant product standard.

  Task force formed to review and make recommendations on Visible Break– ***Colby Lovins, Jonathan Neujahr. Dave Beseda, Edwin Almeida, Joe Stemmerich, Karla (team lead), Francois Soulard, Ted Burse, Ganesh, Kelsey Bush, John Kapitula.*** *The TF has 4 weeks to provide their output.*

- *I-104, Clause 6.7, line 608 manual operation operating force*
  - *Suggest the force to be 50 lbs. and require one position in the standing position.*
  - *A commentor suggested that in some IEC standards 400 Newtons is called out. After some deliberations, the WG rejected the comments since, the force to operate a DSG depend on many factors.*

- END OF MEETING SESSION TWO

- MEETING SESSION THREE

- *Session #3 was on 4/3/2024 and continued with comment ballot comment resolution.*

    - *I-547 subclause 7.7.5.2 Approximately" vs "Essentially' Sinusoidal*
        - *This was discussed at STLNA. There was a task force created (led by Eric Li) who will review and report back to C37.60, C37.74, and C37.100.1.*
        - *There is only one use of the term Essentially Sinusoidal. The plan is to remove the term (and definition) and the language will be "shall be substantially free…".*

    - *I-483, Clause 7.62,*
        - *David Beseda reviewed and made a recommendation.*
        - *He stated the subclause is associated with testing fuse devices. The table referred to is for testing switching devices which are not applicable. Rejecting the comment.*

    - *I-590, clause 7.7.2.1, The term "fusing devices" is too restrictive. This places more onerous restrictions on other technologies that can interrupt faults that may be used to replace fuses. Suggest replacing fusing devices with "fault-interrupting devices".*
        - *Change language in the footnote to: "For fault interrupting devices, "open" in the Device Position column refers to "disengaged" position…"*
            - *Changed language in the footnote to: "For fault interrupting devices and fuses that can be disengaged, "open" in the Device Position column refers to the "disengaged" position…"*

    - *I-942, clause 7.7.2.4, line 942, missing guideline how and what to perform rated power-frequency withstand voltage test for switch way, fused switch way, grounding switch and visual break. Only across the contacts? Or also to ground and between the phases?*
        - *Describe what is applicable for switch way, fused switch way, grounding switch and visual break.*
            - *There is a typo in the draft. Draft referred to the wrong table. Table reference will be changed to Table 8, which provides the information.*

    - *I-612, clause 7.7.2.5, line 974 - This standard does not allow for preliminary shots across an open vacuum interrupter - something acknowledged by C37.60 and IEC 62271-1, line 974 - as common and often necessary.*
        - *Add allowance for preliminary impulses - similar to what is published in or being drafted for IEEE C37.60*
            - *Looking for volunteers to see if we can harmonize with C37.60.* ***Colby Lovins*** *volunteered.*

    - *I-426, clause 3.3, line 429 - What is desired here is to define a generic term "distribution switchgear (DSG)" that can be used for convenience to reference any of the cited terms. It is not intended to redefine the terms listed in bold.*

        - *Delete this paragraph and provide a definition for "distribution switchgear (DSG)" as follows: "distribution switchgear (DSG): a generic term used to refer to any pad-mounted switchgear, subsurface switchgear, vault switchgear, with or without protective devices".*
            - *Accepted but changed definition to*
              distribution switchgear (DSG): a term used to refer to any pad-mounted switchgear, subsurface switchgear, vault switchgear, with or without protective devices.

    - *I-88, 7.7.4.2, line 1049 - Figure 4 Nothing is mentioned regarding the fuse from tank to ground. Identify the fuse in the figure. Add an informative note.*
        - *Identify the fuse in Figure 3 as "Fuse element or ground sensing circuit" as in C37.62-2020 or "Isense" as in C37.63-2024 to be published, or in Figure 6 of this standard. Also Add NOTE— A grounding fuse consisting of a 5 cm (2 in) long #38 AWG copper wire is sufficient to detect significant current to ground. Electronic current metering used in place of the #38 AWG wire may also be considered providing it can accurately sense to 2.6 amps rms.*
            - *Accepted with revision. **I Rokser** provided the following verbiage: NOTE—Electronic current metering may be used providing it can accurately sense to 2,6 amps rms. Alternatively, a grounding fuse consisting of a 5 cm (2 in) long 0.008 mm2 (#38 AWG) copper wire*
            - *3is sufficient to detect significant current to ground.*
            -
    - *I-492, 7.7.4.5, line 1091 - normal during this test the short-time withstand current tests is combined with the peak withstand test. should we mention here that no need for peak withstand test, this is covered during the peak withstand sequence test?*
        - *mention: no need for peak withstand test, this is covered during the peak withstand sequence test.*
            - *In C37.74 short time test has always been symmetric; we do nine peak tests which we have changed to peak sequence test. The commenter wants to make this clearer.*
            - *State that C37.100.1- clause 7.7 is applicable with the following exception.*
              Only symmetrical test is required. WG agreed

    - *For line 1082 subclause 7.7.4.4 remove the word sequence from the title since this a single peak test - Agreed*

    - *I-620, 7.7.4.6, line 1119 - "The DSG may be left closed" - The 5-minute duration specified is more onerous than a shorter duration as it allows cooling of the conductive path and strengthening of any welds. This should be a required minimum duration.*
        - *"The DSG shall be left closed". (Change min to minutes)*

    - *I-625, 7.7.5.7, line 1287 - If this test is not required when load switching is performed, why are we providing rated currents for this test in Table 3?*
        - *Remove column 6 of tables 3 and 4.*

        - *Rejected because in the sub-clause if a user and manufacturer agree they can perform that test which provides some guidance.*

    - *I-451, 7.7.6.2, line 1321 - How many consecutive readings must be the same to indicate that temperature has stabilized? Only 2 in a row? Or 3? Indicate the number required.*
        - *replace "indicated by consecutive readings" with "indicated by 3 consecutive readings within 1 degree C taken…..*
            - ***Brian Gerzeny** will write a sentence. Kennedy needs to send him the comment.*

    - *I-92, 7.7.6.2, line 1321 – same as I-451 so same comments.*

    - *I-494, 7.7.6.2, line 1322 - "temperature rises of table 5 may be exceed", on a certain moment the temperature will stabilizes, it could be that everything is in fire. Would be good if there were limits set by the manufacturer before conducting the thermal runaway test.*
        - *limits for the thermal runaway test should be mentioned by the manufacturer upfront.*
            - *Not discussing today.*

    - *I-16, 4.1, line 443 - Normal (usual) conditions for submersible equipment include the following:*
        - *Missing the word "shall". Change to Normal (usual) conditions for submersible equipment shall include the following:*
            - *Rejected. Because the normative sense is conveyed by Subclause 3.2 of IEEE Std C37.100.1.*

    - *I-591, 7.7.7.3, line 1367 - The inception and extinction voltages are not criteria used to pass the test. Noting and recording the inception and extinction voltage should not be a required step in the procedure. The procedure should not preclude a manufacturer from noting and recording these characteristics, however it should not be a requirement.*
        - *The inception and extinction voltages are not criteria used to pass the test. Noting and recording the inception and extinction voltage should not be a required step in the procedure. The procedure should not preclude a manufacturer from noting and recording these characteristics, however it should not be a requirement.*
            - *There is a C37.60 AD Hoc looking into this. That will carry over to C37.74.*

    - *I-592, 7.7.7.3, line 1379 - We've already established the pre-stress voltage at 1.95x rated phase to earth voltage. Step e) does not seem necessary, and only adds confusion as to what the pre-stress voltage should be.*
        - *Remove step e) from the procedure.*
            - *Rejected because it sets an upper limit. Some manufacturers combine power frequency test with PD and this provides and upper limit.*
    -

8. Any other business

    i. *We will have on-line meetings. There will be a doodle poll. Starting May 13th until the first week of June. Please go and respond to the poll April 12 if he gets it out this week.*

9. Next in person meeting

    - *This will be a virtual meeting. The time is yet to be set.*

10. Adjournment *at 3:15 PM.*

Name (Printed)	Employer	Sign-in Initials Session 1	Sign-in Initials Session 2	Sign-in Initials Session 3
Caryn Riley (Voting-Member)	Georgia Tech/NEETRAC		X	
David Beseda (Voting-Member)	S&C Electric Co	X	X	X
Edwin Almeida (Voting-Member)	Southern California Edison	X	X	X
Eric (Qian) Li (Voting Member)	Powertech Labs	X	X	X
Francois Soulard (Voting-Member)	Hydro-Quebec	X	X	X
Frank DeCesaro (Voting-Member)	DeCesaro Consulting Services, LLC	X	X	X
Harm Bannink (Voting-Member)	G&W Electric	X	X	X
Harold Hirz (Voting-Member)	Vesco	X	X	
Ian Rokser (Voting-Member)	Eaton	X	X	X
Jeffrey Gieger (Voting-Member)	ABB/Elastimold			
John Kapitula (Voting-Member)	ABB	X	X	X
Joseph Stemmerich (Voting-Member)	Trayer Engineering Corporation	X	X	X
Karla Trost (Voting-Member)	G&W Electric	X	X	X
Kelsey Bush (Voting-Member)	ABB/Elastimold	X	X	X
Kennedy Darko (Chair)	G&W Electric	X	X	X
Mohit Chhabra (Voting Member)	S&C Electric	X	X	X
Paul Found (Voting-Member)	BC Hydro	E	E	E
Rahul Jain (Voting-Member)	S&C Electric Co	X	X	X
Travis Johnson (Secretary)	Xcel Energy	E	E	E
Victor Savulyak (Voting-Member)	Kema Labs	X		X
Abe Shocket	ABB	X	X	X
Adrian Lopez (Guest)	Powell Industries			
Al Pruitt (Guest)	The Durham Co.			X
Albert Livshitz	Qualus services			
Andrew Fernandes (Guest)	Trayer Eng	X	X	X
Anil Dhawan (Guest)	Allgos Group			
Ben Hatfield (Guest)	Trayer Eng	X	X	X
Brenan Kirkpatrick (Guest)	SCE			

Brian Gerzeny (Guest)	Powell Electrical Systems Inc	X		X
Bhrugen Amin	S&C Electric	X	X	
Bo Wang	G&W Electric	X	X	X
Charles Worthington (Guest)	Hubbell			
Chris Slattery (Guest)	First Energy			
Christopher Borck (Guest)	Eaton's Power Systems Division			
Christopher Hastreiter (Guest)	Eaton, South Milwaukee WI	X	X	X
Christopher Morton (Guest)	PowerTech Labs			
Cody Marshall (Guest)	Schweitzer Eng			X
Colby Lovins (Guest)	Federal Pacific, Bristol, VA	X	X	X
Connie Yin (Guest)	G&W Electric Co - Canada	X	X	X
Dan Busilan (Guest)	Dominion Energy	X	X	X
Dave Dart (Guest)	Noja Power			X
Ganesh Balasubramanian (Guest)	Eaton	X	X	X
Hall Sigmon (Guest)	Siemens		X	X
Ilya Glinsky (Guest)	Southern California Edison, Westminster			
Jackie Kandel (Guest)	Powell	X	X	X
Jaden Martz	S&C Electric	X	X	
James Wenzel (Guest)	Eaton			
Jon Spencer (Guest)	Utility Solutions			
Jonathan Neujahr (Guest)	Eaton	X	X	X
Joseph Fitzgerald (Guest)	Eaton			
Kate Cummings (Guest)	G&W Electric Co			
Kaylor Garcia (Guest)	Utility Solutions Inc.			
Ken MckInney (Guest)	UL Solutions	X	X	
Kent Coldsnow (Guest)	Fort Collins Utilities			
Leonel Santos (Guest)	Schneider Electric			
Marcos Botelho	Siemens	X	X	X
Mark Feltis (Guest)	Schweitzer Eng			X
Nenad Uzelac (Guest)	G&W Electric Co, Bolingbrook, IL			

Nenad Uzelac (Guest)	G&W Electric Co		X	
Peter Glaesman (Guest)	PCORE Electric / Hubbell Power Systems	X	X	
R. Kirkland Smith (Guest)	Retired	X		
Rob Schuetz (Guest)	Eaton			
Roberto Oliwares (Guest)	Siemens Industry	X	X	
Ryan Kowdley	PG&E	X	X	X
Samuel Andris (Guest)	KEMA Labs			
Stacey Davies (Guest)	Siemens Industry			
Stefan Micic	G&W Electric	X	X	
Tad Mayers	Salt River Project	X		
Todd Grdina	Siemens	X	X	X
Ted Burse	Powell		X	
Tim Tillery (Guest)	Howard Industries Laurel, MS	X	X	X
Truett Thompson (Guest)	Siemens			

Key: X – present
E – excused