C37.74 Working Group Meeting Minutes

Oct 14th 2024, 10:15 AM, Oklahoma City

Chair: Kennedy Darko **Secretary**: Travis Johnson

Meeting Minutes

- **Call to Order**

The meeting was called to order at 10:18am CST by the Working Group Chair, Kennedy Darko.

- **Establishment of Quorum**

Quorum is established with 17 of 22 members present. (First Session)
Quorum is established with 17 of 22 members present. (Second Session)
Quorum is established with 17 of 22 members present. (Third Session)

- **Roll call and Disclosure of Affiliation**

Attendees present stated their name and affiliation. Note here if a quorum was established. A list of attendees (name, affiliation, and voting status) is attached.

- **IEEE SA Patent Policy:** Call for Patents

The call for patents was issued; **no one raised.**

https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.pdf

- **IEEE SA Copyright Policy/IEEE Participant Behavior**

The IEEE SA Copyright Policy slides and the Participant Behavior slides were distributed to participants prior to the meeting. Participants were asked if anyone had not seen the slides, and no one responded. Chair briefly summarized the copyright and behavior policies.

IEEE SA Copyright Policy: https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/copyright-policy-WG-meetings.potx

IEEE SA Participant Behavior: https://standards.ieee.org/wp-content/uploads/import/documents/other/Participant-Behavior-Individual-Method.pdf

- **Approval of the Agenda**

Motion to approve the meeting agenda. (Mover: Mohit, Chhabra; Second: Karla, Trost) The agenda was unanimously approved as presented without objection.

- **Approval of IEEE C37.74 Spring 2024 meeting minutes**

Motion to approve the minutes from IEEE C37.74 Spring 2024 and virtual working group meetings. (Mover: Frank DeCesaro; Second: David Beseda) There was one correction brought forward by Karla Trost and was incorporated into the minutes.
The minutes for Spring 2024 meeting as well as the virtual meetings were unanimously approved with correction without objection. (See list below)

- S24RODEWG3774_Minutes_R1
- V24RODEWG3774_minutes_2024Mar26_R0
- V24RODEWG3774_minutes_2024Mar28_R0
- V24RODEWG3774_minutes_2024May13_R0
- V24RODEWG3774_minutes_2024May16_R0
- V24RODEWG3774_minutes_2024May24_R0
- V24RODEWG3774_minutes_2024May29_R0
- V24RODEWG3774_minutes_2024Jun03_R1
- V24RODEWG3774_minutes_2024Jul26_R0

- **Technical Presentations or Discussions**

Technical discussion focused on ballot resolution from the general ballot #2. Chair asked if any member had any ballot comments, they wanted to discussion besides the comments delineated by the comment resolution group for discussion.

- Add of R1-17 requested – editorial needing tweak.
- Review requested of section 6.3 lin518 of draft 2.0. This was not a ballot comment.
- R1-1 and R1-10 point to same issue but have different disposition that need reconciliation.

Comment resolution discussion:

1. R1-23 and (7.7.4.2 and) Correct grounding method conflict to reflect the intent of the working group and add pass/fail criteria to 7.7.4.6 if the intent is to monitor ground current during the short-circuit current tests.
   - Revised - Use same language in 7.7.5.6.4: All normally grounded parts of the DSG shall be insulated from ground but connected thereto through a suitable device to indicate any significant current to ground.
   - Harmonize to 3 amps instead of 2.6 amps. WG agreed.

2. R1-24 (7.7.5.6.4) Add posttest pass fail criteria concerning monitored ground.
   - Revised – The draft will be updated with the following verbiage from section 8.3 of IEEE C37.30.4 “There shall be no indication of current greater than 3 A to the grounded enclosure structure or screen when fitted during the tests”.

3. R1-4 (7.4.3) - In the last line of table 7 (test no. 8), the number of operations for a grounding switch are shown as 100. This is FAR too low and should be increased dramatically to ensure the grounding switch is mechanically sound over the expected life of the equipment. For example, the IEC standard for earthing switches expects a minimum of 1000 operations for "normal duty" and 2000 for "extended duty". Since the ground switch is a critical safety component in the equipment, the number of operations expected should be much more than 100.

   Change the number of required mechanical operations for grounding switches from "100" to "1000". This would provide a larger factor of safety. If 1000 operations is not accepted, at least raise it to 500 operations.

- Discussion: This might involve more than just increasing number of grounding operations. Proposal to using 250 as that is half the number as the mechanical duty of the switch.
- Proposal made to reduce the number of grounding operation in Table 7 from 100 to 50 operations since this is a condition check post-testing and add grounding duty to section 7.10. David Beseda will review and report back in the next meeting.
- Revised - Following was submitted in session #2 which was accepted.
    - A grounding switch shall be subjected to a minimum of 250 operations without maintenance. A higher number of operations may be performed with agreement between the user and manufacturer.
    - Resistance of the main contacts shall not increase by more than 20%. An increase > 20% of the maximum value measured would require a thermal runaway test to be performed per 7.7.6.3. The condition checks are not applicable for grounding switches.

4. R1-17 (4.2.2), - The newly added c) could be improved for flow and clarity.
   Suggest changing "Exposure to chemical or electrochemical reactions may be encountered in a subgrade environment. These chemicals may contribute to mild corrosive reactions." to "Subgrade environmental conditions containing chemicals that may contribute to accelerated corrosive reactions."
   - Revised – Ian suggested changing ‘may’ to ‘can’ which is what IEC uses. The IEEE-SA Standards Style Manual (2021) was check and affirmed the use of ‘can’. WG agreed. **Disposition: Subgrade environmental conditions containing chemicals that can contribute to accelerated corrosive reactions.**

5. R1-18 (5.3) The text on lines 610 and 611 could be improved for consistency of verbiage with other dielectric clauses and clarity of intent.
   - Suggest changing "The assembly shall pass a dc withstand voltage test in accordance with 7.7.8, with test values based on rated maximum voltage values shown in Column 7 of Table 1." to "The DC withstand voltage shall be the voltage of the way with the lowest rating. The preferred values of DC withstand voltage are based on rated maximum voltage and shown in Column 7 of Table 1. Tests shall be in accordance with 7.7.8."
   - Discussion: If you look at what is in the short-circuit, it uses the same language as a commenter proposed. WG agreed. **Disposition – Accepted.**

6. R1-50 (7.7.7.4): Inception voltage and extinction voltage should be required measurements for a design test. The product should be able, by design, not to incept until above its rated maximum voltage and to extinguish above its rated maximum voltage.
   - **Rejected:** Discussion – While inception and extinction voltages are good information to have for partial discharge diagnostics and analytics purposes, these should not be requirements. The pass / fail criteria is dependent on the test voltage which is set higher than the system voltage to ensure extinction voltage will always be higher than the system voltage. Making this a requirement will also require setting pass / fail criteria for inception and extinction voltages. This will also make testing power frequency and PD together almost impossible.

7. R1-51 (7.8.1): Change “inadvertently directly contacted” to “inadvertently touched”.

- After review there were other opportunities for language improvement and cleaning up. The purpose and applicability of the tests were clarified. A proposed language for 7.8.1 was drafted and accepted by the working group. Comment was dispositioned as revised.

8. R1-10 (6.8): Item b) appears to be incomplete. Missing the word window or similar. Change to "placing position indication behind a viewing window."
   - **Working group agreed following discussion. Comment accepted.**

9. R1-56 (8.3): Routine tests may be performed on a sampling basis." One of the functions of partial discharge testing is to detect deleterious voids, gaps or other geometry problems within individual poles which may vary part-to-part based on the manufacturing process. Sampling is not appropriate given such objectives.
   - **Working group agreed following discussion. Comment accepted.**

10. R1-55 (8.3): "the pre-stressing voltage may be reduced as specified by the relevant product standard" - What does this mean? This is the product standard. This document should define how much the pre-stress voltage may be reduced while still achieving the goal of incepting PD in the DUT.
    - Define by how much below 1.95 x phase-to-earth voltage the pre-stress voltage may be reduced.
    - Caryn R was tasked to review and report back to the working group. In the second session Caryn presented the attached and the working group agreed to the following language.
        - …the pre-stressing voltage may be reduced to the lowest pre-stress voltage of the assembled components as specified by the relevant product standard. For example, if the voltage supply interface utilizes IEEE 386 separable connectors, the pre-stress voltage may be reduced to the partial discharge pre-stress voltage of the separable connector's rating.

Technical Comment R1-55 Presentation_

11. R-63, R-64, R-67 (7.7.4.3.1): These comments are all related to peak withstand sequence testing. Harm Bannink presented the attached discussing the extreme nature of this test and made proposal for modifications such as tolerance on the peak value and the number of peaks required to be applied to each phase.

index xx peak current test v2.pptx

- There was lengthy discussion on the topic which straddled both the second and third meeting sessions.
- In the end the following options were presented by the chair for members to vote on. Option 1 was to reject the comment and leave the testing per ballot #1 resolution, option 2 was to incorporate discussion from ballot #2.

Option 1

- **Set #1**: Peak Phase A (100%)- 10s – Peak (100%) – 10s – Peak (100%)

  Pause (Not less 11 minutes)
- **Set #2:** Peak Phase B (100%)- 10s – Peak (100%) – 10s – Peak (100%)

  Pause (Not less 11 minutes)
- **Set #3:** Peak Phase C (100%)- 10s – Peak (100%)– 10s – Peak (100%)

Option 2

- **Set #1**: Peak Phase A (100%)- 10s – Peak (=>90%) – 10s – Peak (=>90%)

  Pause (Not less 11 minutes)
- **Set #2:** Peak Phase B (100%)- 10s – Peak (=>90%) – 10s – Peak (=>90%)

  Pause (Not less 11 minutes)
- **Set #3:** Peak Phase C (100%)- 10s – Peak (=>90%) – 10s – Peak (=>90%)

- Voting results were as follows:
  - Option 1 – 2 votes
  - Option 2 – 10 votes
  - Abstentions – 5 votes
- Following the voting, there were discussions on the verbiage for option 2 to fulfil the intent and how to address the tolerance requirements. Whether to reference the general tolerance table in annex or use language like that in C37.60. Chair stated that the final language will be created and reviewed with the working group for approval in a virtual meeting.
- **Subsequent to the meeting**
  - After the meeting, issue was raised concerning how the Option 1 and Option 2 were addressed.
  - Per review with the Main Committee Chair, Action Item direction by the Main Committee Chair (based on consultation with IEEE SA Staff) is as follows:
  - At the next WG meeting, the discussion of Peak Current should be addressed again using Robert Rules of Order procedures such as: a motion (shown on screen to the WG), a second, discussions, and vote.

12. Non ballot comments:

- HD1: (Line 1240, 1241), The fuse way has the same test with the peak current withstand. Suggested to remove “except the peak current shall be applied in an outer phase with the current in the other outer phase starting with a major loop” to fall in line with C37.100.1
  Voting:
  Leave in - 0
  Remove -3
  Abstain - 10
  - **Decided to leave in.**
- FD1: (Line 1367, 1368): There are discussion on the STLNA side about the definition of sinusoidal and the statement of peak to fundamental component not exceeding 1.2. Remove: “This condition is considered satisfied if the ratio of the peak value of the current

to the peak value of the fundamental component does not exceed 1.2." This will leave the statement general enough to fall in line with any conclusion from STLNA.

    - **Following discussion, the working group agree that the current statement does provide some direction and it will be better to leave in for now.**

- KD1: (Line 1865) pointing to table 2 instead of table 1. **WG agreed to change reference to table 1.**
- KD2: (Line 1812) Corrected language to read opening and closing speeds instead of opening and closing speed. **WG agreed.**
- KD3: In 9.1 for field tests, the interpretation is that the device is expected to be tested to 80% of design tests which ends up being higher than the production test performed in the factory pre-shipping. Recommend changing the reference to point to the production test value instead. **WG agreed.**
- PF1: Concern raised with safety related to filed pressure gauges and switches and what redundancy could be applied to improve safety. This was tabled. PF will send email later with details for consideration by the WG.

- **Future Working Group Meetings**

Virtual meetings will be held as needed followed by Spring 2025.

- **Adjourn**

The Chair (Kennedy Darko) adjourned the meeting with all business completed.

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	x	x
David Beseda (Voting-Member)	S&C Electric Co	x	x	x
Edwin Almeida (Voting-Member)	Southern California Edison	E	E	E
Eric (Qian) Li (Voting Member)	Powertech Labs	x	x	x
Francois Soulard (Voting-Member)	Hydro-Quebec	E	E	E
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	E	E	E
Ian Rokser (Voting-Member)	Eaton	x	x	x
Jeffrey Gieger (Voting-Member)	ABB/Elastimold	R	R	R
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	x	x	x
Rahul Jain (Voting-Member)	S&C Electric Co	x	x	x
Travis Johnson (Secretary)	Xcel Energy	x	x	x
Victor Savulyak (Voting-Member)	Kema Labs	x	x	x

Name (Printed)	Employer	Sign-in Initials Session 1	Sign-in Initials Session 2	Sign-in Initials Session 3
Colby Lovins (Voting Member)	Federal Pacific, Bristol, VA	x	x	x
Dan Busilan (Voting Member)	Dominion Energy		x	x
Christopher Borck (Non-Voting Member)	Eaton's Power Systems Division	x	x	x
Ganesh Balasubramanian (Non-Voting Member)	Eaton	x	x	x
Andreas Bartels (Non-Voting Member)	Powell Industries			x
Brian Gerzeny (Non-Voting Member)	Powell Electrical Systems Inc	x	x	x
Peter Glaesman (Non-Voting Member)	PCORE Electric / Hubbell Power Systems	x	x	x
Christopher Hastreiter (Non-Voting Member)	Eaton, South Milwaukee WI	x	x	x
Jackie Kandel (Non-Voting Member)	Powell	x	x	x
Adrian Lopez (Non-Voting Member)	Powell Industries		x	
Federico Michele (Non-Voting Member)	CESI		x	x
Al Pruitt (Non-Voting Member)	The Durham Co.		x	x
Rob Schuetz (Non-Voting Member)	Eaton	x	x	x
Chris Slattery (Non-Voting Member)	First Energy	x	x	x
Tim Tillery (Non-Voting Member)	Howard Industries Laurel, MS	x	x	x
Cody Marshall (Non-Voting Member)	Schweitzer Eng	x		
Andrew Fernandes (Non-Voting Member)	Trayer Eng	x	x	x
Ben Hatfield (Non-Voting Member)	Trayer Eng	x	x	x
Abe Shocket (Non-Voting Member)	ABB	x	x	x
Sterlin Cochuan (Non-Voting Member)	G&W Electric	x	x	x

Name (Printed)	Employer	Sign-in Initials Session 1	Sign-in Initials Session 2	Sign-in Initials Session 3
Todd Grdina (Non-Voting Member)	Siemens	x	x	x
Sathish Govindarajan (Non-Voting Member)	Schneider Electric	x		
Bob Lau (Non-Voting Member)	nVent (Hoffman Enclosures)	x		
Paul Barnhart (Non-Voting Member)	UL Solutions	x		
Tim Rohrer (Non-Voting Member)	Exiscan LLC	x	x	
Kaleb Spencer (Non-Voting Member)	S&C Electric	x	x	x
Vladimir Kirienko (Non-Voting Member)	Tavrida Electric	x	x	
April Faulkner (Non-Voting Member)	PCORE Electric / Hubbell Power Systems	x	x	x
Marcos Botclho (Non-Voting Member)	Siemens	x	x	x
Jason Jeter (Non-Voting Member)	Mersen	x	x	x
Pedro Castillo (Non-Voting Member)	ABB	x	x	
Robert White (Non-Voting Member)	OG+E	x	x	x
Eduardo Ruiz Vazquez (Non-Voting Member)	Eaton	x	x	x
Jeramie Cooper (Non-Voting Member)	Eaton		x	x
Stefan Micic (Non-Voting Member)	G&W Electric Co		x	x
Sergey Rogozkin (Non-Voting Member)	Tavrida Electric			x
Koustubh Ashtekar (Non-Voting Member)	Siemens Industry Inc			x