# C37.74 Working Group Meeting Agenda

April 11, 2022 1:30 PM – Orlando, FL

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

## Meeting Agenda

**1. Call to Order** K Darko

**2. Call for Patents** K. Darko

a. Patent Slides
Patent Slides shown by Kennedy. No one brought up any patent concerns.

b. Copyright Slides
Copyright Slides shown by Kennedy. No one bought up copyright concerns.

**3. Introduction of Members and Guests**

**4. Attendance and Quorum Check** T. Johnson

19 Members – 10 Required for Quorum.
13 members recorded in attendance. Quorum is reached.

**5. Approval of Agenda** K. Darko

a. Approval moved by: Karla Trost
b. Second by: David Beseda

**6. Approval of Previous meeting minutes** T. Johnson

https://www.ewh.ieee.org/soc/pes/switchgear/minutes/2021-2/F21RODEa5REV0.pdf

1. Approval moved by: David Beseda
2. Second by: Joe Stemmerich

**7. Action Items** K. Darko

**a.** Review project timeline and milestones.
**b.** Editorial review update
   i. Discuss findings of editorial review
   ii. Secondary reviews and recommendations.
**c.** Review of known technical items
   i. BIL – Reviewed with proposal
   ii. Fault making - Reviewed with proposal
   iii. Magnetizing current – Reviewed with proposal
   iv. Cable charging - TBD

**8. New Business:** K. Darko

**a.** Visible Break

**b.** Influence of Alternative Gases – Review C37.100.7
**c.** Arc Resistance – Should this be covered in C37.74
**d.** Switches with semi-conductive exteriors
**e.** Should C37.74 be a standalone document vs an overarching document. WG to provide RODE with a recommendation.

**9.** **Next Meeting** is scheduled to take place at the Fall IEEE Switchgear meeting.

Harmonize with Recloser standard C37.60.
Interrupter standard C37.62.

Clauses 2007 and 2018 version are getting referenced. There are differences that will require review.
Are there items in 2007 that are not in 2018. If yes, need both, if no, then 2018.
Need to be specifically referenced. Many 2007 references, none for 2018.
One reference is not dated and would default to 2018. Rest of references have 2007 referenced. Need to revise document and see if can go to latest year (2018).

Cable charging – C37.100.2 is different than c37.60 or c37.62 cannot have more than 3 restrikes.
Can take exception and just list number of restrikes.
Can reference C37.100.2 but would need to take a number of exceptions
C37.100.2 Section 4.4.4 is used and use the circuit from IEEE 1247. IEEE 1247 is gone and do not have a circuit to use.
Could pull the circuit from C37.62 for cable charging. C37.60 has circuits. Both of these standards are using the same circuits.
Could use C37.62 or C37.60 for the circuit. Also instead of C37.100.2, 4.4.1 has a circuit.
There is a comment to not use C37.100.2. Can pull the circuit from C37.60 or C37.62 into C37.74.
If we do that, would need pull in the testing criteria. No more than 3 restrikes for cable charging.
Need to pull in some additional items from the procedure.
In C37.62, pull in cable and line charging to C37.74. This is because we are more aligned to c37.62.

Lines 250 and 251. Can reference C37.100.1. can reference section 6.1, this would simplify document, would bring all three with 1 reference.

Subclause 6.2.6.2 You cannot have a “shall” in a note. Should be an endnote so it is required instead of normative. User can use a pressure relief valve or some sort of port. Should not call it a pressure relief port, just need to have a port, call it the name with the least amount of baggage.

Subclause 6.11 does not mention the unit being designed for the weight. If it is oil filled, it will weigh more. Typically, do not mix oil and air. If the cabinet size will have difference depending on oil or air.
S&C designs around the heavier configuration for each configuration. Do not have different designs around each configuration.

Subclause 6.13, standards says corrosive resistant, but does not specify the material. For example could use fiberglass. But it will wear. Should it be the requirements or call out the specific material. Harmonized

currently with C37.62. Currently do not address crud and nameplate can be covered in crud over time which can make etched stainless steel is illegible over time.

Subclause 7.4.3 condition of switching devices and temperature. IEC has various definitions, can, shall, etc. Can is possibility. Should is recommendation. In this situation, it is "should". If DC resistance is in this range, then it is capable of carrying the current in this range. The requirement is needed so word is "shall" be capable. Pull in from C37.62 language and use the word "shall".

Subclause 6.6.2.27 Should make his informative rather than as a requirement.

Subclause 7.7.2.2. IEEE changed. Method 1 and Method 2. Change to refer new IEEE 4. Recommend change to Method 1 and correct for atmospheric correction factors.

Subclause 7.7.25 lighting impulse. Consider moving the verbiage from C37.62 clause 7.3.7.3. Going to pull over the verbiage directly into C37.74 from C37.62.

Subclause 7.7.3.3 DC should be lower case dc per IEEE.

2nd Session Notes

John Leach spoke about fuses. Fuses, C37.41, C37.42, C37.43, C37.44, C37.45, C37.46 standards. Consolidated these standards into C37.41 and C37.42. C37.41 has testing and definitions. C37.42 has the preferred values for the test. Current efforts are ongoing to combine into 1 document so you can test any type of fuse. Different than IEC that has type of fuses into different standard (current, expulsion, etc). Needs to be done by 2026. Should be finished by 2023/2024.

C37.48 is the tutorial standard and applications. Mirror of IEC document. C37.48.1 was combined with C37.48.
Can reference C37.41 and C37.42 unless the consolidated document is released first, then will just reference C37.41.

Subclause 7.7.4.2. currently states 3A is suitable, what current or CT should be used. Currently use wire, and maybe add wire with some sensing to address this. Test labs are monitoring through ground rather than the wire. The labs monitor, do not fuse. If you use a 3A fuse, it will have a time component. Could use test current or significant current, both still are undefined. If you have a fault and what kind of ground current is the threshold that needs to be defined. Can measure after the test what the ground current to define? C37.30.4 define no greater than 3A for the current. For fault close, insulated from ground, suitable device to measure no greater than 3A. proposed "no current greater than 3A". C37.30.4 clause 8.1.3 has verbiage
There shall be no indication of current greater than 3 A to the grounded structure, or screens when fitted, during the tests.

Subclause 4.2.3 number changed c37.100.1 and moving number to point to the new section. Part of the harmonization that cause the difference. Need to update reference. Also reference of 5.5 section is wrong and should be updated to Table 5 which has the material temperature rises and the table that it should have been pointing to originally. The table is in C37.74 Table 5.

Subclause 4.2.6 update the subclause

Subclause 4.2.6 update the “special conditions” with “these special conditions should be considered”

Subclause C57.12.34 seems to be the replacement for C57.12.25. Need both 3 phase and 1 phase. David Beseda will review and recommend the appropriate standard callout.

Change the reference from C57.12.28 to C37.75. C37.75 should be published prior to C37.74. Can reference a draft specification as long as the draft specification is sent along with it so it can be referenced with the ballot.

Subclause 7.3.3 the mechanical operations after the test, need to have several tests after short circuit test. But the order of the test is not given. You can get different values depending on which order of test is conducted. Only short circuit test is given. Condition after short circuit test. Mechanical testing shall be done after the short circuit tests.

Subclause 7.4.2, test sequence must be completed before going to the next section. The next section provides the condition of the switching device. 6, 7, 8 is proposed to be a post test to validate the condition of the switching device after the test sequence is completed. This section is going to need more work. Need to determine if 6, 7, and 8 is needs to be done as post checks. As written, if this is done, this will make test 7 optional which there is agreement that this is a required test. Can 6, 7, 8 be kept in the table, to reference the tests in the table or add a row that is post test validations. A, B, and C is written in the opposite order as it is intended right now. Should be C, B, A. Kennedy Darko and Victor Savulyak to propose a proposal to the working group.

Subclause 7.4.3, test does not provide the value. The criteria needs to be stated. Suggested using 200% value for test.

Line 727 Interval between, what to do, different manufacturers and get different devices. Ian Rokser to work on.

Subclause 7.7.4.4 The current at the tenth cycle shall not be less than the short circuit. Suggested to add three phase tests the average of the current shall not be less than 10% of the average.

Line 777, suggestion to have time between test agreed by manufacturer and user and documented.

Need to make a determination what should happen between the tests and duration. There is nothing written down on if you can operations. Does not define no load or with load. Nothing to determine a limit or parameters are documented. Herman and Ian to dig into this and create a proposal for the working group. Cautioned this test should not cover switch abuse.

Subclause 7.7.4.6 rated fault making current test. Currently reference the IEEE 1247 testing to state that alternative methods are not allowed. Remove the prohibition on alternative method.

Subclause  due to inconsistency in switches, you cannot have precise closing.  Peak shall be on the outside phase, but could be on the inside phase.  If it is on the inside phase, you have not satisfied the criteria and need to rest because it needs to be on the outside phase.  It is not clear why this is needed on the outside phase and it has already been tested.  C37.30.4 the fault making test.  It is the same except, the outside phase requirement was removed.  Historically 71 didn't have the requirement.  Was trying to harmonize IEEE 1247.  Never required 71, 72, 73.  Not intended to make the standard more difficult.
Peak shall not be less than 2.6 times, at least 1 phase.  Only way to not get 2.6 times is if cause by pre-arcing.  So could end up doing numerous test to get 3 tests with 2.6 times.  Proposal is to match IEC so out of the series of test 2.6 times.

Due to the number of items that are un-resolved, it is suggest to have a virtual meeting to resolve the open items.  Prior to the next meeting.  Will provide the invitation to the member and guests.  Imeet Central if guests are set as observers, they will get the meeting.

Will have an upcoming short virtual meeting.

**10. Adjournment**
**Frank DeCesaro moved for adjournment**
**Ian Rokser seconded**

## Annex 1: Attendance

| Role | First Name | Last Name | Company Name | Fall 2021 | Spring 2022 |
|---|---|---|---|---|---|
| Guest | Robert | Smith | Retired | | |
| Member | Donald | Martin | G&W Electric Co. | X | X |
| Member | Francois | Soulard | Hydro-Quebec | X | |
| Guest | Chris | Ambrose | Federal Pacific (Div. of Electro-Mechanical Corp.) | X | X |
| Member | Jeffrey | Gieger | ABB/Elastimold | | X |
| Guest | William | Walter | We-Energies | | |
| Member | Harold | Hirz | G&W | X | X |
| Member | Harm | Bannink | G&W | X | X |
| Member | Antone | Bonner | PAS Consulting | X | |
| Guest | Jon | Spencer | Utility Solutions | | |
| Guest | Brian | Gerzeny | Powell Electrical Systems Inc | X | X |
| Member | Wangpei | Li | Eaton | | |
| Member | Christopher | Borck | Eaton's Power Systems Division | X | X |
| Guest | James | Wenzel | Eaton | | |
| Guest | Paul | Found | BC Hydro | | |
| Guest | Brendan | Kirkpatrick | Southern California Edison | X | |
| Member | David | Beseda | S&C Electric Co. | X | X |
| Secretary | Travis | Johnson | Xcel Energy | X | X |
| Guest | Karla | Trost | G&W Electric | X | X |
| Guest | Joseph | Smith | FortisAlberta | | |
| Guest | Ian | Rokser | Eaton Corp | | X |
| Member | Michael | Whitney | S & C Electric Company | | |
| Member | Rahul | Jain | S&C Electric Company | | X |
| Chair | Kennedy | Darko | G&W Electric Co | | X |
| Guest | Richard | Frye | Eaton | | |
| Member | Edwin | Almeida | Southern California Edison | X | |
| Guest | Katherine | Cummings | G&W Electric | X | |
| Member | Caryn | Riley | Georgia Tech/NEETRAC | X | X |
| Guest | Larry | Putman | Powell | X | X |
| Member | Stephen | Pell | Siemens | X | |
| Member | Grant | Ringham | BC Hydro | X | |
| Guest | Ashley | Moran | IEEE Standards Association (IEEE-SA) | | |
| Guest | Jose | Gamboa | The H-J Family of Companies | | |
| Guest | Vaidyanathan | Ramasethu | G&W Electric | | |
| Guest | John | Kapitula | ABB | X | X |
| Guest | Benjamin | Isaak | American Electric Power | | |

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| Guest | Doug | Edwards | Siemens | X | |
| Guest | Claude | Florvil | PSEG | X | |
| Guest | Jack | Geng | Powertech Labs, Surrey, BC | X | |
| Guest | Dan | Busilan | Dominion Energy | X | |
| Guest | Kate | Cummings | G&W Electric Co, Bolingbrook, IL | X | X |
| Member | Frank | DeCesaro | DeCesaro Consulting Services, LLC | X | X |
| Guest | Ilya | Glinsky | Southern California Edison, Westminster, CA | X | |
| Guest | Christopher | Hastreiter | Eaton, South Milwaukee WI | X | X |
| Guest | Colby | Lovins | Federal Pacific, Bristol, VA | X | X |
| Guest | Chris | Morton | Powertech Labs, Surrey, BC | X | |
| Guest | Kirk | Smith | Self (Retired) | X | |
| Guest | Noel | Smith | FortisAlberta | X | |
| Member | Joseph | Stemmerich | Trayer Engineering Corporation | X | X |
| Guest | Andrew | Swisher | Southern California Edison | X | |
| Guest | Tim | Tillery | Howard Industries Laurel, MS | X | X |
| Guest | Nenad | Uzelac | G&W Electric Co, Bolingbrook, IL | X | X |
| Guest | Joseph | Wisnewski | UL LLC | X | |
| Guest | Oswaldo | Kaschny | Siemens | | X |
| Guest | Roberto | Oliwares | Siemens Industry | | X |
| Guest | Jackie | Kandel | Powell | | X |
| Guest | Stacey | Davies | Siemens Industry | | X |
| Guest | Truett | Thompson | Siemens | | X |
| Guest | Victor | Savulyak | KEMA | | X |
| Guest | Ngoc | Bui | SDG&E | | X |
| Guest | Jen | Santalli | IEEE Standards Association (IEEE-SA) | | X |
| Guest | John | Leach | Self | | X |
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