

Annex C Distribution Subcommittee – Chair: Stephen Shull

November 4, 2015

Memphis, TN

Chair: Stephen Shull

Vice-Chair: Jerry Murphy

C.1 General Opening

Steve opened the meeting welcoming everyone to the meeting. Jerry circulated the rosters. To establish a quorum, a list of members were displayed and a count of was made. We did have a quorum with 35 of the 42 members in attendance by count of those identified on a slide presented in the meeting. Recorded attendance gave 135 in attendance, 36 members and 23 requesting membership.

The agenda was reviewed and motion made by Dan Sauer, seconded by Ron Stahara and approved by unanimous acclamation of the members in attendance.

The Spring 2015 meeting minutes were reviewed and motion made by Dan Sauer, seconded by Sanjib Som and approved by unanimous acclamation of the members in attendance.

C.2 Working Group and Task Force Reports

C.2.1 C57.15/IEC 60076-21 – Step-Voltage Regulators – Craig Colopy

Craig presented the following minutes from the working group meeting on November 2, 2015 at 4:45 p.m. with 37 people in attendance.

1. Meeting was called to order at 4:45 pm, 2 October 2015, Quorum was made with 21 of 27 Members in attendance.
2. Approval of San Antonio, TX minutes and Memphis, TN agenda was given. (Dan Sauer made the motion and Steve Shull seconded.)
3. The Chairman reviewed a presentation of the work status of MT60076-57-15 Step-Voltage Regulators given at the IEC TC14 meeting in Boras, Sweden this past month regarding the work and status of latest Draft 1.1 completed after the work in San Antonio, TX.
4. Murty Yalla spoke regarding a IEC TC95 meeting last week in France noting the deletion & consolidation of the IEC control environmental design test standards used in 60076-57-15.
5. Chairman advised the WG members taking part in the Work Session on Friday and Saturday, October 30th & 31st a Draft 1.2 would be a result of the work completed in Memphis using the previous provided Draft 1.1 as a template. Goal after the meeting would be to submit a CD (committee draft) to IEC and to IEEE for balloting.
6. Chairman reviewed Minutes of Work Session and resulting Draft 1.2 with the rest of the Working Group members and Guests during the Working Group Summary Meeting on Monday, Nov 2.

7. Copies of supporting documentation, presentations, Minutes of Meeting and Draft 1.2 will be placed on the 60076-57-15 website.
8. Steve Shull made the motion that Draft 1.2 be sent to the Distribution Subcommittee for Approval to Ballot. Seconded by Dan Sauer. Only two negative votes were received, thus this received a 2/3 majority for approval
9. Work Session for IEEE Ballot resolution and IEC CD comment considerations will take place in Atlanta IEEE Spring meeting, March 18-19, 2016.
10. Next IEEE Transformer Committee WG meeting— Monday, March 21, 2016 at the Sheraton Atlanta Hotel in Atlanta GA.
11. Motion to Adjourn by Steve Shull- Dan Sauer Seconded - Motion carried without comment.

Close of Meeting: 6:00 p.m., Gael Kennedy recording.

C.2.2 C57.12.20 – Overhead Distribution Transformers – Al Traut

Al presented the following minutes from the working group meeting on November 2, 2015 at 11:15 a.m. with 66 in attendance.

The Meeting was called to order by Al Traut at 11:15am, Monday, November 2, 2015.

General introductions were omitted due to the loss of 15 minutes with the “Duck Walk” viewing.

Al reviewed the membership requirements and added two new members, Kendrick Hamilton and Taib Tikvesa

Member validation was taken to qualify a quorum being present. Current membership required 18 members be present, representing a quorum. The count was 23 members, present at the time the validation was taken, therefore, a quorum was declared.

A motion was made by Ron Stahara, seconded by Justin Pezzin to approve the agenda as written and submitted. There were no negative comments or votes and the motion was unanimously approved.

A motion was made by Ron Stahara, seconded by Taib Tikvesa to approve the minutes as written and submitted. There were no negative votes. The motion was unanimously approved.

Paragraph 4.3 was discussed, including table 12, the minimum impedance values. There was some discussion. Brian Klaponski suggested some changes be made for clarification. After a discussion, the following note was added.

“These impedances may result in per unit short circuit levels that exceed Distribution Transformer Short Circuit Withstand per C57.12.00. It is recommended that the end user evaluate other requirements, such as voltage regulation, system impedance, or available fault current when using these values”.

Several other corrections were review and discussed, specifically the Low Voltage ratings found in 7.1.3 and 7.1.4.

Clause 7.2.5.1 stating liquid vapor was discussed. Liquid vapor was changed to “vaporized insulating liquid”. No motion was necessary for this was an editorial change clarify what was written.

The paragraph 7.2.6.1 was discussed, specifically the comment “excluding the cover gasket and gasket liquid”. Dan Mulkey felt that the reference to gasket liquid was not the intent. He stated that he would not want to see any oil expelled. A recommendation was made by Al Traut to leave it as it is and get comments during the ballot process. This was generally agreed.

Al Traut identified an issue with Fig A1 Note 4 in Annex A regarding the vertical spacing of the old C support lug. The figure referenced Clause 6 and 7 of Annex A and these clauses do not exist. The group agreed to accept the changes made to the vertical spacing in figure A1 Note 4 to list the dimensions in Note 4 of Fig A1.

Steve Shull made a motion to take this document to ballot, seconded by Ron Stahara. There was no discussion and a vote was taken. The vote was unanimous with 25 members attending voting affirmative. The document will be moved to the DT Subcommittee for vote to move to balloting.

Ballot resolution group will review the comments from the ballot and report back to the WG at the next meeting. The following volunteered to participate in the Ballot Resolution Group: Al Traut, Ed Smith, Giuseppe Termini, Carlos Gaytan, Steve Shull, & Ret Chrysler.

The meeting was adjourned at 12:12PM, Ed Smith recording.

C.2.3 C57.12.28, C57.12.29, C57.12.30, C57.12.31, C57.12.32 – Enclosure Integrity – Dan Mulkey

Dan Mulkey presented the following minutes from the working group meeting on November 3, 2015 at 8:00 a.m. in with 48 in attendance.

Dan Mulkey called the meeting to order at 8am.

Introductions were made and a call for quorum showed 26 of the 38 WG members were in attendance giving quorum. Note that the full attendance list is recorded and available in the Association Management System.

The agenda was reviewed by the WG then Sanjib Som motioned for approval with Ron Stahara second and no further discussion the motion was unanimously approved. Minutes of the Spring 2015 meeting were reviewed and with a minor amendment a motion was made by Ron Stahara to approve as amended and Bill Wimmer seconded. No further discussion was held and the minutes were passed by the majority of members in attendance with no dissenting or abstaining votes.

Dan reviewed the status of the standards group with C57.12.28, 29, 30 & 31 inactive as all have recent publications requiring no action for a while with the earliest expiration dates in 2020.

C57.12.32 IEEE Standard for Submersible Equipment – Enclosure Integrity is active, last published in 2003, and reaffirmed in 2008, and due for revision by 2018.

Dan commented that there are a number of comments from the Reclosers and Other Distribution Equipment (RODE) Subcommittee of the Switchgear Committee and resumed discussion of these comments with the WG.

1. Dan asked Carlos Gaytan to look for IEC standards for testing of submersible transformers. Dan said he would forward the email from the RODE member who commented to Carlos to clarify the request.
2. Dan requested volunteers from the WG to form a task force to research the definition of submersible. Adam Bromley agreed to head the TF along with Jeremy Van Horn and Giuseppe Termini.
3. Dan presented a proposed definition for “Enclosure.”
 - a. The WG discussed the terms vault and manhole.
 - b. Ron Stahara motioned and Said Hachichi seconded approval of the definition as amended and the WG passed unanimously.
4. Dan presented information from Q-Lab regarding the FS-40 bulb used for ultraviolet testing per ASTM D4587-01. Q-Lab stated the bulb is still available and that there is an alternative bulb, UVB-313EL available.
 - a. Rebecca Giang with Sherwin-Williams offered to look at collecting data to compare the two bulbs. Rebecca discussed gloss levels involved in testing depending on the starting levels.
 - b. Darren Brown of Howard will also look into collecting data for comparison.
5. Dan presented an issue about an official protest to C57.12.34 regarding materials in the standard by Will Byrd. Byrd recommended three defined corrosion zones.
 - a. Discussion started with how the existing C51.12.32 uses material loss to determine acceptable substrate material.
6. Dan discussed section 4.1 Enclosure Design Requirement Objective comparing this standard to C57.12.28 and C57.12.29 seeking to develop a common objective.
 - a. A question was raised about instrument materials used with stainless steel materials in high chlorine environments.
 - b. The WG discussed establishing a minimum stainless steel grade as the existing standard was based on 409. Giuseppe Termini made and Anil Dhawan seconded motioned to document 304L stainless steel as the minimum grade for the standard. The WG approved the motion unanimously.
 - c. Tom Holifield mentioned a paper by GE from the late ‘60s that gave a great discussion on 409 stainless steel and would look to provide a citation to the WG.
 - d. Brian Klaponski made and Alex Macias seconded motioned to change the wording of 4.1 eliminating the words “generally not dry” aligning the wording with C57.12.40. The WG passed the motion unanimously.

Next meeting will be held in Atlanta, Georgia on March 22, 2016.

Time was expiring and Dan adjourned the meeting at 9:15am, Jerry Murphy recording.

C57.12.34 – Three Phase Padmount Transformers – Ron Stahara

Ron presented the following minutes from the working group meeting on November 2, 2015 at 3:15 p.m. with 71 in attendance.

Ron Stahara called the meeting to order and introductions were made. The rosters were circulated. The complete detail of attendance is recorded in the AM system. To establish a quorum, a members list was displayed on the screen and those who saw their names were asked to hold up their hand. From this count of hands, it was determined that a quorum was established. A motion was made by Ed Smith and seconded by Justin Pezzin to accept the

agenda as shown. The motion was passed unanimously. A motion was made by Ed Smith and seconded by Justin Pezzin to accept the minutes of the Spring 2015 meeting as written. The motion was passed unanimously.

Ron Stahara announced that the Standard was approved and would be published by the beginning of next year.

A quick review was conducted of the questions that were raised after the ballot or had been suggested in the balloting process. These were discussed and categorized in the companion document that would be submitted in the next revision.

Ron asked for items that should be considered in the next revision. These were gathered and would be listed in the companion document. This companion document will be posted on the Transformer website.

Time ran out and a motion was made to adjourn by Jerry Murphy and seconded by Gael Kennedy. This motion passed unanimously.

With this, the meeting was adjourned, Stephen Shull recording.

C.2.4 C57.12.36 – Distribution Substation Transformers – Jerry Murphy

Jerry reported the working group met Tuesday afternoon at 1:45p.m. with 59 people in attendance.

Jerry Murphy called the meeting to order at 1:45 PM. Introductions were made. The names of the members were projected on the screen. By a show of hands the quorum was reached by having 10 out of the 17 members present. Ron Stahara made a motion approve the agenda of the meeting; Gary Hoffman seconded, and the motion was approved. Ron Stahara made a motion approve the minutes of the last meeting in San Antonio; Lee Mathews seconded, and the motion was approved.

Jerry mentioned that there were 8 comments pending to be resolved from the ballot of draft 4, and proceeded to review them. The first comment was about sect. 5.11.2 Fan motor voltage. After some discussion, Steve Shull made a motion to modify paragraph to include 120 V motors. Gary Hoffman seconded, and Lee Mathews made a friendly amendment to modify additional the text in the paragraph for consistency. The motion carried. The 2nd comment reviewed was related to sect. 5.11, that it did not require an interposing relay. After discussion, Steve Shull made a motion to reject the comment, Marty Rave seconded. The motion carried. 3rd comment reviewed was about sect. 5.11.2, related to the use of a temperature control relay for fan control. Steve Shull made a motion to reject the comment, Marty Rave seconded. The motion carried.

The 4th comment reviewed was about sect. 5.13.1, and the text “Practical Guide”, questioning if it was informative or normative. After discussion, Lee Mathews made a motion to change “Practical Guide”, to “Note”; Marty Rave seconded. The motion carried. The 5th comment was about the last paragraph of sect. 5.1.7, pressure relief device, questioning if the original intent of the text related with rupture discs, because of the flow rate specified. After some discussion Dan Mulkey suggested to send this proposal by an email ballot resolution. The last comment was that the temperature range of sect. 5.9.2

should be 110°C instead of 100°C. Steve Schroeder made a motion to accept the comment. Ron Stahara seconded. The motion carried.

Jerry informed that he requested a PAR extension to complete the resolution of the comments from the ballot, and once approved, he would initiate the ballot recirculation process.

He informed that the next WG meeting would be in Atlanta, GA, in March 20-24. Lee Mathews made a motion to adjourn; Marty Rave seconded. The meeting adjourned at 3:00 pm., Carlos Gaytan recording.

C.2.5 C57.12.37 – Test Data Reporting – Tom Callsen

Tom Callsen reported the working group met Tuesday afternoon at 3:15 p.m.

The Chair called the meeting to order, and attendees made introductions. The rosters were circulated. The details of attendance are recorded in the AM system. To establish a quorum, a list of members was displayed, and members in attendance held up their hand. From the count of hands, it was determined a quorum was established. Ron Stahara introduced a motion with a second from Dan Mulkey to approve the Fall 2015 meeting agenda as written. The motion passed unanimously. Ron Stahara introduced a motion with a second from Steve Shull to approve the Spring 2015 meeting minutes as written. The motion passed unanimously.

The Chair informed the working group the IEEE-SA Standards Board approved the latest revision of C57.12.37 on September 3, 2015.

During discussion, the following motions passed unanimously regarding feedback from the most recent ballot:

- Alan Wilks introduced a motion with a second from Ron Stahara to maintain the existing phrase “nominal voltage” rather than change to “rated tap voltage” in paragraphs 4.2.14 through 4.2.22.
- Dan Mulkey introduced a motion with a second from Alan Wilks to maintain the valid insulating liquid values in paragraph 4.3.9 as currently shown and consider adding ester fluids in the next revision.
- Steve Shull introduced a motion with a second from Ron Stahara to maintain the values for producer plant location in paragraph 4.3.2 as no more than ten characters rather than increasing the field to twenty characters.
- Steve Shull introduced a motion with a second from Ron Stahara to maintain the current ASCII file format requirement and consider changing to XML file format in the next revision.

The Chair announced the working group has finished their work and will become inactive.

There **will not** be a Spring 2016 working group meeting in Atlanta, GA., Martin Rave recording.

C.2.6 C57.12.38 – Single Phase Padmount Transformers – Alan Wilks

Alan presented the following minutes from the working group meeting on November 2, 2015 at 1:45 p.m. with 54 in attendance.

Filling in for Ali Ghafourian and Mike Faulkenberry were:

Chair: Alan Wilks

Vice Chair/Secretary: Ed Smith

Alan Wilks called the meeting to order at 1:48PM on Monday, November 2, 2015.

The group went around the room introducing themselves.

Member validation was taken to qualify a quorum being present. Current membership is sitting at 33; therefore, 17 members were required to represent a quorum. The count was 17 members, present at the time the validation was taken, therefore, a quorum was declared.

A motion was made by Ron Stahara, seconded by Carlos Gaytan, to approve the Agenda as written and submitted. There were no negative comments or votes and the motion was unanimously approved.

A motion was made by Ron Stahara, seconded by Jerry Murphy to approve the minutes as written and submitted. There were no negative votes. The motion was unanimously approved.

Alan reviewed the current status of the document with the Working Group

It was agreed to work on the Corrigenda first prior to moving forward with working on the document. Bill Bartley reviewed the need to work on the Corrigenda prior to proceeding. On a motion made by Ron Stahara, seconded by Jerry Murphy and approved by the working group, it was decided to move forward with the Corrigenda before proceeding with the document. The Corrigenda adds back in the omitted note above the bushing height dimension stating 167kVA and 250kVA above.

A motion for adjournment was made by Jerry Murphy, seconded by Ron Stahara. The motion passed unanimously. The group adjourned at 2:11PM. The meeting adjourned at 3:00 p.m., Ed Smith recording.

C.2.7 C57.12.39 – Tank Pressure Coordination – Carlos Gaytan

Carlos reported the working group met Tuesday afternoon at 4:45 p.m. with 43 in attendance.

The meeting was called to order at 4:45 PM. Introductions were made; the names of the members were projected on the screen. By a show of hands the quorum was reached by having 18 of the 32 members present. By the end of the meeting the member count was 22. The agenda was presented. A motion for approval was made by Ron Stahara, seconded by Jerry Murphy. The motion was approved. A motion to approve the minutes of the Spring

2015 meeting was made by Ron Stahara, seconded by Jerry Murphy. The motion was approved.

On the chair report, Carlos informed that the PAR expired in Dec. 2016, and that there was an item in the agenda to vote to initiate a sponsor ballot process. On old business, the work of the Task Force on PRD flow rate was presented. Josh Herz said that the task force was really attempting to bring the real operating characteristics for PRDs being used in line with the wording of the standard, which had not been met for some time with the current PRDs. New wording for the PRD operating characteristics was reviewed. Dan Mulkey said that the data of PRD should not be part of definition. Al Traut questioned if by removing the data from definitions, the PRV and the PRD could be differentiated. Omar Ahmed mentioned if rupture discs should be considered on the document. After some discussion, Dan Mulkey made the motion to strike the last 3 lines of the PRD definition. Steve Shull seconded. The motion carried. Then Dan Mulkey made the motion to simplify the definition of PRV similar to the motion on PRD. Steve Shull seconded and the motion carried. Adam Bromley asked why the rapid transient test isn't required for square tanks like pad mounts. Carlos responded that the group decided not to include these types of equipment as they have a higher mechanical capacity to absorb energy than round tank designs.

Then Draft 4 was reviewed; it included the comments to Draft 3 that were received after the Spring 2015 meeting. Al Traut made the motion to accept the changes proposed in Draft 4; Alejandro Macias seconded, and the motion was approved unanimously.

On New Business, the chair entertained a motion to initiate sponsor ballot process for Draft 4. Ron Stahara made the motion, seconded by Jerry Murphy. The motion was approved by 20 of the 22 members with recorded attendance. A Ballot Comment Resolution Committee was formed, with Carlos Gaytan, Justin Pezzin, Chris Sullivan, Omar Ahmed, and Dan Mulkey. Dan Mulkey volunteered to review Draft 4 for proper grammar. The document will be sent to the Mandatory Editorial Coordination (MEC), and then initiate the Ballot process. This motion will be presented to the Distribution SC for approval. The next WG meeting will be in Atlanta, GA, in March 20-24. Ron Stahara made a motion to adjourn; Omar Ahmed seconded. The meeting adjourned at 5:50 pm., Justin Pezzin recording.

C.3 Old Business

- None

C.4 New Business

- Steve Shull presented a revision to the SC scope modifying it to include voltage regulators and address the enclosure integrity standards. Ron Stahara motioned to approve; Dan Sauer seconded and much discussion ensued with editorial considerations. After several revisions were offered as friendly amendments with some accepted and other rejected Gary Hoffman called the question. The SC approved the call with 26 in favor and 1 opposed. The motion was then voted on as amended and the motion carried with 30 in favor of the revised SC scope. The following is the final scope:

The Distribution Transformers Subcommittee shall be responsible for the following:

- a. Studying and reviewing engineering aspects of voltage regulators, distribution overhead, distribution pad-mounted, and distribution substation transformers. This would include enclosure integrity, and surface coatings and corrosion resistant materials as related to the enclosure.
- b. Developing and maintaining related standards, recommended practices, and guides for such products
- c. Coordinating with other technical committees, groups, societies, and associations as required

Steve will present this revised scope to the full committee in the closing session on Wednesday.

- Phil Hopkinson presented a need for definition of renewable transformers which he considers as step-up power transformers.
Phil asked the members to consider should a renewable (step-up) transformer be a distribution or power class? Phil stated that if they are distribution transformers then the DOE could govern the efficiency while power step-up transformers are not. Dan Sauer offered that if they are power transformers they might not be tested for some useful things like impulse testing. Ron Stahara asked if the DOE rules cover power transformers and Phil said, not presently.

C.5 Chairman's Closing Remarks and Announcements

Steve had no closing comments to the SC except to see them in Atlanta in the spring.

C.6 Adjournment

Ron Stahara made a motion and Dan Sauer seconded to adjourn the meeting and the SC approve by unanimous acclamation.