

Annex D Dry Type Transformers Subcommittee

March 27, 2019

Anaheim, CA USA

Chair: Charles Johnson

Vice-Chair: Casey Ballard

Secretary: David Stankes

D.1 Introductions and Approval of Agenda and Minutes

Casey Ballard, Vice-Chair, led the meeting as Chuck Johnson did not attend this meeting.

The Subcommittee met on March 27, 2019 at 1:30PM in the California Ballroom A room of the Hilton Anaheim Hotel.

The meeting was convened with 46 people in attendance. 16 of the 26 members of the Dry Type Subcommittee were present, so quorum was reached. Three guests requested membership. The attendance roster will be recorded in the AMS. Participants at the meeting introduced themselves and roster was circulated.

The Vice -Chair reviewed the proposed Agenda. A motion to approve the agenda was made by Rhea Montpool and seconded by Mike Sharp. The agenda was approved unanimously.

The Vice-Chair noted that the unapproved minutes from spring 2018 SC meeting had been posted on the SC Transformer Committee website. A motion to approve the minutes was made by Ken Klein and seconded by Jim Antweiler. The minutes were approved unanimously.

D.2 Chairs Remarks

Vice-Chair reviewed required information to be included in all WG and TF minutes. These include:

- The name of the activity
- The date and time of the meeting
- The number of members and guests in attendance. Full attendance should be recorded in the AMS system
- The presence or absence of a quorum
- Any essential patent issues raised during the meeting.
- A summary of discussion. Intricate detail not required. Use a separate document to explain decisions that are made.
- A record of the decisions made in the meeting
- If there will be another meeting. If so, state the time and place.
- Submit WG minutes as soon as possible, but no more than 15 days after the meeting Spring 19 due by 4/12/19.

Casey challenged TF and WG leaders to submit minutes from meetings in a timely manner, ideally before the sub committee meeting on Wednesday.

Vice-Chair reminded the WG Chairs that they need to review their roster and move anyone who is not attending or participating from a Member to a Guest. Members who may be moved to Guest status or removed as Member include anyone who has missed three consecutive meetings and anyone who has communicated that they will no longer be participating/attending.

Casey noted that among the DTSC membership we have two new main committee members: Ken Klein and Mike Sharp.

Vice-Chair noted that the new copyright policy that was reviewed during the Standards Development Review Luncheon has raised many questions that need to be resolved or answered. IEEE is planning to host (five) webex training sessions in the coming weeks to address questions from members. Casey recommended attending one of these sessions and to be prepared to discuss specific examples of how the new copyright policy may impact your ability to work on standards.

D.3 Working Group/Task Force Reports

The next order of business was the presentation of the reports of the various working groups and task forces. See the following sections for the individual reports:

D.3.1 Revision of IEEE PC57.12.01 - Dry Type General Requirements Chair Casey Ballard

The working group met in the El Capitan Room of the Hilton Anaheim Hotel.

The meeting was called to order at 1:45 PM by Chairman Casey Ballard.

Chairman made opening comments.

WG Roster was distributed and signed. Participants introduced themselves.

The meeting was convened with 45 participants, 19 of them are members. Quorum was reached (24 current members). 6 guests requested membership. The attendance will be reported in the AMS.

The Agenda was approved unanimously being no negative votes (after moved by J. John and seconded by D. Walker).

The Minutes of Fall 2018 Jacksonville meeting was approved unanimously (moved by T.-F. Mai and seconded by R. Wicks).

The chair made a call for known patents and took some time going over the IEEE guidelines on the patent disclosure. No patent related issues were claimed.

Old Business

- Chair used the attached presentation to facilitate the discussion.



IEEE C57-12-01
Spring 19.pptx

- Chair informed that the following revision from Fall 2018 was incorporated into Draft 6 and circulated to the membership (along with some edits in support to WG decision going to ballot)
 - Updated impedance rating definition in Section 5.8.
- Short Circuit Thermal calculation in Section 7.10 – an additional alternative method is under consideration by IEC 60076-5. D. Walker presented the changes that are considered by IEC in this regard and example of their implementation. He concluded that there is no difference in short circuit temperature calculations between the currently published equation and proposed IEC formulas for temperature rises up to 1000°C. Both match well with the existing IEEE method. David suggested to use the existing formula in this revision of C57.12.01 and consider the new formula in a future revision. R. Marek presented the draft of the Annex A (informative) to IEC document that describes the background of the new calculation. Rick proposed to include IEC formula in a current IEEE revision because, in any case, the new formula is more correct mathematically and it's even easier to use. In support of this, motion was made by M. Iman and

seconded by V. Tendulkar. The motion passed by 17 affirmative votes. The new formula will be included in the Draft 7 of the revision as an alternative method to the existing IEEE calculations.

New Business

- D. Walker suggested to improve definitions of routine, design and other tests in Section 8.3. David made a motion to include the proposed language to make it consistent with IEEE C12.00 and follow the test sequence defined in IEEE C57.12.91 providing additional explanation for clarity. J. Antweiler seconded the motion. In the discussion, P. Hopkinson asked to check what definitions are in IEEE C57.80 because such definition shall be applicable for all IEEE standards. The language was somehow close, but the group favored (because IEEE C57.80 wasn't as widely known and used compared to IEE C57.12.01) and voted on the initial motion; motion passes by 19 affirmative votes. The respective language will be included in the Draft 7. In aftermath of the vote, P. Hopkinson moved the concern of the repeatability of the statements on the tests, but his motion didn't receive a second and was abandoned.

- J. Tedesco questioned the logic of the description of the impedance tolerances for duplicate transformers provided in section 9.2 under a), b) and c). In the discussion, D. Patel mentioned the practice where tighter tolerances ($\pm 5\%$) are required when a series of identical transformers are produced in the same time in other industry standards. P. Hopkinson asked about whether we can find a consensus on the acceptable tolerance for paralleling transformers. Such consensus didnt exist. After additional discussion, D. Patel made a motion to reduce the text of section 9.2 to the following statement:
 "The impedance of a two-winding transformer shall have a tolerance of $\pm 7.5\%$ of the specified value. The impedances of transformers having three or more windings, or having zigzag windings, as well as autotransformers shall have a tolerance of $\pm 10\%$ ".
 The motion was seconded by T-F. Mai. Motion passed with 17 affirmative votes and 2 abstentions.

- In the following discussion, W. Li expressed the end user's opinion that note on transformers parallel operation shall warn the users on parameters of concern for this operation. D. Walker moved the motion to revise section 4.2.6.r as follows:
 "Parallel operation. It should be noted that while parallel operation is not unusual, it is desirable that users advise manufacturers if paralleling with other transformers is planned and identify the ratings of the transformers involved. Users should consider the matching of unit voltages and impedances in specifying transformers for parallel operation for appropriate load sharing".
 The motion was seconded by J. Tedesco. Motion passed with 18 affirmative votes.

- Chair final remarks:
 - PAR expires 12/31/2020.
 - No other new topics to be included in the final WG Draft 7.
 - WG will go for a ballot to submit to Dry Type SC for approval to proceed to SA ballot in Fall 2019 (this also aligns with the schedule of IEEE C57.12.91)
 - Next Fall 2019 meeting: Columbus, Ohio, USA, October 27-31, 2019.

With no further business, the meeting was adjourned at 3 PM.

Chairman: Casey Ballard

Secretary: Sasha Levin

D.3.2 Revision of IEEE PC57.12.60 - Dry Type Thermal Aging Chair Roger Wicks

The WG met on March 26, 2019 at 1:45PM in El Capitan room of the Hilton Anaheim Hotel. The meeting was called to order at 1:45 PM by Chairman Roger Wicks. Introductions were made and attendance sheet was circulated.

The meeting was convened with 32 people in attendance. 14 of the 23 active members of this working were present. Quorum was reached. Two requests for membership were accepted based on attendance and involvement with the survey ballot. The attendance will be reported in the AMS.

The Chairman reviewed the proposed Agenda, noting the addition of New Business topic that was not in the original agenda that was sent out prior to the meeting. Motion to approve the modified agenda was made by Tim-Felix Mai and seconded by Vijay Tendulkar. The agenda was approved unanimously.

Motion to approve the minutes from the Jacksonville Fall 2018 meeting was made by Casey Ballard and seconded by Joe Tedesco. The minutes from the fall 2018 WG meeting were approved unanimously.

The chairman presented slides pertaining to essential patent claims (no issues were noted) and meeting guidelines.

Working Group Survey Results

The Chair reviewed results of the draft survey that was sent out to WG members and guests.

- Good input received from both working group members and guests.
- 187 comments received, most of which were editorial in nature. All the comments were reviewed, and with only a few exceptions were included into the revision.
- Excluded comments typically were in conflict with other parts of the document and/or did not provide an alternative.
- Major areas revised will be discussed along with one significant item needed prior to completing this work.

Key Items Changed during Revision based on Survey

The Chair identified three key items that were changed in the draft document based on comments received during the survey. They included:

- Clarification of terminology – improved description of test objects for consistency through document.
- Tying the test conditions to those called out in IEEE C57.12.01 and IEEE C57.12.91
- Significant changes to the Clause 9 which deals with the modification of an approved system.

The chair noted that much of the discussion planned for this WG meeting centered around changes in Clause 9.

Clause 9 review:

- Chair noted that Casey Ballard had identified (unmaintained) IEEE C57.12.55 as a document containing a procedure to deal with changes to an insulation system such as we have in IEEE C57.12.60. This procedure has been added to the Annex of the 12.60 draft as Annex G, and sections of this document were used to address items from our draft.
- Chair noted a proposal to utilize an Enhanced Sealed Tube (EST) test. This test was described as more severe than current Sealed Tube Chemical Compatibility Test but less

severe than earlier draft proposal for a three point or one point (for certain conditions) test. The test conditions for the EST are based upon aging condition table found in current draft of 12.60. Details of the testing were discussed.

Solomon Chiang asked if current CCT could still be used for certain conditions, such as approval of chemically equivalent material substitutions and minor (non- insulating) components. Chair confirmed this would be the case.

Joe Tedesco asked who came up with the conditions for the test, and Chair responded conditions were developed with considerations from content found in the C57.12.55 document.

A question was raised regarding experience of using the EST test. Chair responded that there was data that supports its validity, but data was confidential and could not be shared.

Joe Tedesco suggested that perhaps a round robin test be conducted to validate the test. Chair responded that he was confident that test would pass with materials currently used today, but that some of the new materials may pose a problem.

Casey Ballard suggested that the 3-point test originally proposed may not work for non silicone type varnishes that have been shown to work in application due to a too high high-temperature point.

Chair highlighted that EST proposal would be twice as severe as current CCT method due to 10C increase in temperature, and time period would be longer than current 336 hours. This was balanced with the fact that no other components other than the varnish and insulation material would be include in the EST test.

Casey Ballard suggested that EST test should specify that ambient air (no other gasses) should be used in the EST sealed tube. Chair noted he would add this to the new draft.

Joe Tedesco and Casey Ballard addressed concern of not specifying exact aging time, as there is a time range in the 12.60 recommended aging table.

Joe Tedesco made a motion to specify the use of aging conditions found in the second line of the aging condition table found in 12.60 draft, and that aging time should be the highest value listed. Casey Ballard seconded this motion. Discussion surrounding the elimination of Class 240 in aging table due to it not aligning with IEC was made by Vijay Tendulkar. After some discussion it was decided to leave this information in the draft table and motion was approved unanimously

New Business

A Note was added to Clause 3.1 in the draft document describing an alternative method to IEEE 259 for testing low-voltage windings below 600V. This method would test at a 1.2 kV voltage class level where voltage is scaled down using the method described in Clause 9.4.

Next steps

Chair agreed to reorder the document for improved flow by the end of April. The Chair will then send out the document to Working Group members for an up or down vote to decide on if to move the document forward.

A Task Force for comment resolution was formed, including:

- Dhiru Patel

- Tim-Felix Mai
- Joe Tedesco
- Dave Stankes
- Casey Ballard
- Roger Wicks

The WG agreed to meet again at the Fall 2019 IEEE Transformer meeting.

Meeting was adjourned at 2:55PM.

Notes prepared by Dave Stankes.

Chair: Roger Wicks

Co-Chair: Dave Stankes

D.3.3 Revision of C57.12.51 – Ventilated Dry-Type Power Transformers – Sanjib Som

No report given as WG did not meet. The document is scheduled to be reviewed at May 2, 2019 RevCom meeting.

D.3.4 Revision of IEEE PC57.12.91 - Standard Test Code

Chair David Walker

The Working Group met in Laguna Meeting Room. The meeting was called to order at 4:45 PM by Chairman David Walker.

Chairman made opening comments.

Introductions were made by all participants. WG Roster has been distributed and signed.

There were 32 people present. 14 out of 17 members and 16 guests were present. A quorum was present. The attendance was reported in the AMS.

The agenda was approved unanimously. Motion: Tedesco, Joe - Second: Tendulkar, Vijay

The minutes of the October 2018 meeting in Jacksonville were approved unanimously. Motion: Iman, Mike - Second: Tedesco, Joe

The patent call was given. No one replied with any patent issues.

Old Business

- The chair presented the changes from Last Meeting.
 - o Sound Level Revision -> Updated to match C57.12.90 with changes suggested by R. Girgis.
 - o 50/60 Hz Results Conversion
 - In Fall 2018 there was concern that the conversion of noload losses might be different for dry than liquid. C57.12.90 lists the following conversion factors from 50Hz to 60Hz
$$B \leq 1.4T = 1.32$$
$$B > 1.4T = 1.32 - 0.05 \times (B - 1.4)$$
 - Several members offered to provide test data. So far, none has been provided.

- A comparison of core steel manufacturer data for a number of different core materials was shown
- Discussion.
 - The group think that an upper limit would be good. The chair suggests 1.9T
 - Patel, Dhiru suggest that the factor will only be used if no other conversion data is available
- Tendulkar, Vijay will send data to Chair
- Motion to include 50/60 Hz Results Conversion as a normative annex into the standard Motion: Tedesco, Joe - Second: Iman, Mike (10 in favor) motion passed
- Motion that the factor will only be used if no other conversion data is available Motion: Patel, Dhiru- Second: Ballard, Casey (13 in favor), motion passed

New Business:

- Discussion about the scope, why are rectifier transformer excluded. This is covered in C57.10.18.
- Comparison of eq 23 if it matches with IEC60076-11. IEC only addresses AN and AF cooling no sealed units. AN is the same as in IEC. AF is different (0.9 IEC vs. 1.0 in IEEE)
- Discussion about eq 26, if the exponent should be changed from a fixed number to n to cover different cooling types
- Motion Patel, Dhiru Second: Roger Wicks to change the exponent of eq 26 to cover different cooling types (7 in favor, 1 against 5 abstain)

Final remarks from the chairman:

- PAR expires 12/31/2020
- GOAL- Complete discussion and changes by Fall 2019 meeting and have WG vote to go to ballot. Use late 2019 and 2020 for ballot process.
- Goal- stay synchronized with C57.12.01 revision cycle.
- Freeze changes after Spring 2019 meeting.
- WG vote on draft in Fall 2019 meeting
- Create Comment Resolution Group in Fall 2019.
- Submit draft to MEC to start ballot process.

With no further business, the meeting was adjourned, without objection, at 5:30 PM.

The Working Group will meet again at the Fall 2019 meeting in Columbus, OH, October 27-31.

Chairman: David Walker

Vice Chairman: Tim-Felix Mai (acting as Secretary)

D.3.5 IEEE PC57.16 – Dry Type Reactors

Chair Art Del Rio

The working group for the revision of C57.16 met in the El Capitan room of the Hilton Anaheim Hotel on Monday March 25, 2019, at 9:30 AM.

1. Introductions and Call for Patents

- The meeting was called to order at 9:30 AM by the WG Chair Art Del Rio.
- The meeting was opened with the introduction of participants.
- The WG Chair Art Del Rio did a call for potentially essential patents. None was reported.

2. Circulation of Rosters

- The attendance rosters were circulated.

3. Verification of Quorum

- There was a total of 22 participants: 9 Members and 13 Guests out of which 4 guest requested membership; 3 were granted based on attendance.
- 9 of the current 12 WG Members were present and quorum to carry out business was met.
- The meeting agenda, which was circulated by email among members and guests on March 16, 2019 by email, was presented to the participants.
- There were no objections or comments and the agenda was approved unanimously.

4. Approval of the minutes of the October 15, 2018, meeting in Jacksonville, Florida.

- The minutes from the F18 meeting in Jacksonville, which were circulated on March 16, 2019 by email, were presented to the participants.
- There were no objections or comments and the minutes were approved unanimously.

5. Continue to discuss and review

- Comments, by all, should be sent to the chairman Art del Rio.

5.a Main body of the standard sections 3 through 12. All members.

- Pierre Riffon proposed to change the factor 2.55, for calculation of peak short circuit current, to 2.7. The reason is that X/R for a reactor is much higher than for AC networks and it is the reactor that provides the dominating inductance.
The value 2.7 shall be used (as 2.55 today) if another value is not specified by the purchaser. Pierre has provided explanations that will be incorporated.
Affected clauses are 5.63 and 10.2.2.
Also clause 11.6 must be rephrased. It does now say “A system fault is typically composed of a full offset peak current ...”. The term “full offset” can be interpreted as the maximum theoretical factor of 2.82 and should be replaced by the selected factor K from clause 10.2.2.
- The reference to IEC 60076-10 should be changed to a reference to an IEEE standard. IEC 60076-10 should also be removed from normative references. If it is referred to from informative parts of the standard then it should be added to the Bibliography instead.
- The normative references should only be references that are referred to from the main text. References that are referred to as e.g. “more information can be found in ...” should be listed in the Bibliography.

5.b Scope

- The scope should also cover converter reactors for SVC applications. Those reactors are stressed in a similar way as filter reactors.
- Should pre-insertion inductors be added? They are used to limit the current stresses of circuit switches they do not have continuous stresses, except for dielectric stresses (if located on high potential).
They could be added to a new Annex or to the existing Annex B (with explanation of differences).
Standards for circuit switches might have something regarding this application.
This question is parked for now.

5.c Update on proposed on 2-level, 3-level, multi-level converter reactors. Ulf Radbrandt

- Annex G does now contain information about converter reactors, for multi-level VSC converters, that are located in series with the valve modules. Those reactors will be stressed with both AC and DC current and they will be covered by IEEE 1277 and not by this standard. Those reactors should be removed from this standard. Instead we should add converter reactors, for multi-level VSC converters, that are located in series with the transformers. The figures with voltage across and current through the multi-level converter reactors should be updated with smaller voltage steps to show a more expected wave shape. Extra figures, zoomed in e.g. at zero crossing should be added to show the principle wave shape (with small steps in voltage and corresponding result in current). Figure G.2 should be updated accordingly. Ulf Radbrandt will provide a proposal of updated Annex G.

5.d Annex B - Dry-type air-core shunt capacitor reactors. Update, Dave Caverly

- No new updates.
- This Annex should be in line with IEEE C37.012 “Guide for the Application of Capacitance Current Switching for AC High-Voltage Circuit Breakers Above 1000 V”. Perhaps we should have a joint TF with the SWG committee. Dave Caverly might go to the SWG committee meeting in April and can then discuss this with them.

5.e Annex A - Filter reactors update, Klaus Pointner

- No new updates.

5.f Annex C – Discharge CLR for series capacitor banks, update, Mike Sharp

- No new updates.

5.g Annex F - System considerations, TRV section update. Monty Goulkhah

- We should add a note for Figure F.1 to explain that the source can be at any of the sides.

5.h Annex D – Reactors supplied in enclosures

- The enclosures can either be for personal protection or for sound shielding.
- We should explain that the enclosure should normally not be used for mechanical support of e.g. connecting cables or bus-bars. If the enclosure is used as sound shield then the vibrations from connected bus-bars might give extra noise via the sound shield. If the enclosure would be used for mechanical support anyway, then the load must be given by the purchaser.

6. New Business

- There was no new business.

7. Adjournment

- The meeting was adjourned at 10:43 AM.

Respectfully submitted,
Chairman: Art Del Rio (a.delrio@ieee.org)
Secretary: Ulf Radbrandt (ulf.radbrandt@ieee.org)

D.3.6 IEEE PC57.124 – Dry Type Partial Discharge Guide Chair

Date and Location: 3/26/19 at 8:0 am in Laguna (4) in Hilton Anaheim, CA

Meeting was called to order at 8:0 am by Chair Tom Prevost.

1. This was followed by welcome and some general remarks about scope of the work of this WG.
2. Introduction of attendees took place at 8:02 am. Two paper rosters were circulated and the WWG waited for an email alert from the AMS for the quorum of present attendees. Pending which the following business followed:
- 3) Patent slide was displayed by the Chair. There was no essential claim essential presented by any attendee.
- 4) Scope of the WG was displayed by The Chair and an introduction provided for new guest members. Subsequently, updates from the four task forces were discussed as follows:

TF 1 Normative References and Test Definitions: Casey Ballard no update yet as waiting for updates from the remaining three TFs.

TF 2- PD Detection and Systems Test Procedures- Detlev Gross

New doc will be generated in concert with document from C.57.113 Chaired by Ali Naderian. To simplify work of this WG. Difference between the two documents from these respective groups will focus on:

- 1) Frequency range
- 2) Noise floor
- 3) Calibration Techniques

Raja K. suggested to add 'Measuring Impedance specifications' as well. Brief discussion followed. This topic will be added as an annex to this document and information to be provided by Raja K. Detlev G. indicated that a draft for his TF work will be provided before the next meeting in Columbus, OH. Tom P. to provide the latest word document of this standard guide.

TF 3- Calibration and measurement impedance techniques - Ali Naderian
No update available

TF 4- Bibliography Jagdish Burde

No update available. Jagdish Burde will work with Tom Prevost's help to compile this topic.

By this time the AMS send an alert of the quorum of attendees at about 8:18 am and it was 61% at that time. Thus, the previous unfinished items were attended as follows:

5) Approval of agenda: there was a friendly amendment by Chair Tom Prevost to his original agenda by including approval of minutes of previous meeting in Jacksonville, FL.
Motion made by Casey Ballard; seconded by Detlev Gross. Approved unanimously.

6) Approval of minutes of previous meeting in Jacksonville, FL.
Motion made by Detlev Gross and seconded by Tim -Felix Mai - approved unanimously. At his time

the quorum was updated as at 65%: 15/24 @ 8:33 am.

7) New Business

7.1 Casey Ballard, Chair SCDT: He mentioned a point of order:

The PAR expires in 2021 and std express end of 2019. Need to speed up the work of WG. If WG cannot archive to complete its work, then the Chair of this group needs to write an email to Jim Graham of Standards to indicate the progress as the standard expires and get the date extended.

7.2 Jeff Britton spoke about the work his group is doing on generic aspects and problems faced in PD Detection and will send more information via email at the request of the Secretary to be available to membership of this WG as well.

7.3 Jitka Fuhr described her work on detection and location of PD using acoustic methods for liquid filled transformers. She will send information via email at the request of the Secretary to be available to membership of this group.

7.4 Copyright issue- Detlev Gross

This is a serious issue as described in the lunch meeting of the Std/IEEE SA yesterday and felt this should be brought to the attention of the SC Chair of DT transformers; and then to the SC.

7.5 Secretary of this group Hemchandra Shertukde, described the requirements for membership of this group as per the PP manual of IEEE-TC and after attending the WG Transformer training Session conducted by Jim Graham from 7-8 am 3/26/2019:

a) If you request membership of this group you should attend 'two consecutive' meetings to be considered for membership.

b) To maintain membership individual member should attend 'three out of five meetings' or else will be removed of the membership to help maintain quorum requirements to conduct t meetings.

Barring no further new items; Meeting was adjourned at 9:0 am.
Next meeting will be held in Columbus, OH in Fall of 2019.

Respectfully submitted

Hemchandra Shertukde
Secretary
WG C57.124

D.3.7 IEEE PC57.12.52 – Task Force for Sealed Dry-Type

Chair Joe Tedesco

The Task Force met in El Capitan Meeting Room. The meeting was called to order at 11:02 AM by Chairman Joseph Tedesco.

Chairman made opening comments.

Introductions were made by all participants.

There were 16 people present. Since this is the first meeting of the TF, all attendees will be added to the TF as members.

The agenda was approved unanimously. Motion: Dhuru Patel, Second: Casey Ballard

The patent call was given. No one replied with any patent issues.

Title of existing Standard was shown. Chair proposed simplifying the title (and scope) in a manner similar to C57.12.51 by removing references to specific kVA and voltage ranges.

Casey Ballard noted that Dry Subcommittee is tending to move toward more simplified titles of standards. C57.12.01, C57.12.91, C57.12.50, C57.12.51 all simplified their titles. Dhuru Patel suggested simplifying title to first line on the existing title only.

Vijay Tendulkar moved to change title to “IEEE Standard for Sealed Dry-Type Power Transformers. Hemchandra Shertukde seconded. In discussion, Casey Ballard suggested adding “and Distribution” after “Power” in the title. Suggestion that title be such that the standard distinguished itself from any other standards. After discussion there was consensus that the existing proposal satisfies this concern.

Vote was unanimous except for one abstention. Title will be “IEEE Standard for General Requirements for Sealed Dry-Type Distribution and Power Transformers”

Chair led discussion on proposed Scope of PAR and displayed current scope. Casey Ballard suggested limiting lower voltage range to 1.2kV class. Upper to 34.5kV class. Suggestion on limiting gasses to Dry Air and Nitrogen. Jerry Murphy suggested making scope similar to C57.12.01. Casey Ballard suggested limiting System voltage to 36kV with one voltage 601V or higher. Much discussion on wording. After much discussion by the group it was agreed that limiting the voltage range to different of that in that of C57.12.01 was not required. Discussion proceeded down path of duplicating C57.12.01 scope except deleting ventilated and non-ventilated types from the scope statement. Discussion of including single phase or not, more than two windings or not. Chair displayed proposed scope of C57.12.52. Discussion of what additional exclusions are needed in C57.12.52 compared to C57.12.01. David Walker suggested wording for the exclusions to be the same as C57.12.01 plus two additions. The question was raised by Casey Ballard about whether the scope of one document could reference the scope of another document. Chair is going to ask Malia about that issue.

Because time was running out, the Chair agreed to bring proposed Title and Scope to next meeting in Fall 2019. Casey Ballard agreed to provide copy of existing C57.12.52 standard to TF. Casey Ballard to look for IEC Standard allowing SF6 as a fill gas in sealed transformers.

After a motion by Hemchandra Shertukde with a second by Vijay Tendulkar the meeting was adjourned at 12:17pm.

The Task Force will meet again at the Fall 2019 meeting in Columbus, OH.

Chairman: Joseph Tedesco

Secretary: David Walker

At the SC meeting there was a question raised as to why certain gasses were excluded from the document. Casey Ballard explained that evidence from e-mails (Charles Johnson and Sheldon Kennedy) during last revision indicated that the WG was pooled to determine if experts on other gasses were available. None were available so no information on these other gasses was included.

Following the report to the SC, Joe Tedesco requested (and was granted) permission by the SC to extend the Task Force to complete its work.

D.3.8 IEEE 256 – Low Voltage Thermal Aging Chair David Stankes

Chair: Dave Stankes

Vice-Chair: Joseph Tedesco

This was the first meeting of the task force. There were 6 people present in person and 1 person present via phone. The meeting was held in the Balboa B meeting room and was called to order at 9:30 AM.

The agenda was approved. As this was the first meeting, there was no old business.

New Business:

- Dave Stankes discussed the background that led to the development of this task force, namely that in Spring 2018, a vote had been taken in the Dry-type Subcommittee to allow IEEE 259 to be administratively withdrawn when it expired and not work on it, but in Fall 2018, it was voted that a PAR should be written to revise the standard. Joseph Tedesco pointed out that he had made the motion to revive IEEE 259 because IEEE C57.12.60 referenced it. Casey Ballard then described the situation where IEEE 259 would be used to test LV coils.
- Ken McKinney was asked what UL did for testing LV coils and he answered that UL has allowed LV coils to be tested using UL 1446 and not IEEE 259.
- Dave Stankes asked whether maintenance of the standard could be done in off-schedule meetings (i.e., not just at the Spring and Fall meetings). Roger did this for IEEE C57.12.58. The meetings must be publicized, and we should ask whether other members of the Subcommittee would want to participate. They may not, but we should ask. Joe Tedesco asked whether Ed van Vooren would be able to participate, given the pending IEEE rules on copyright, because his expert opinions would be valuable, even though he is not a member. Casey Ballard planned to check on this.
- Dave Stankes stated that the first matter to address was why we want to bring back a standard that no one uses. Ed echoed that sentiment. Joe stated that we should not reference an expired/withdrawn standard in an active standard if we had no intention to maintain the standard that was being referenced. Ed then listed a number of standards where IEEE had done just that. Casey Ballard reminded everyone that the mandate from the Subcommittee was to write a PAR for IEEE 259.
- Roger Wicks discussed aging tests, particularly aging tests for LV coils, were not being used as they were originally intended. Furthermore, he stated that the tests described in IEC 61857-1 were different from the tests described in IEEE 259, which is why IEEE 259 was called for in the latest revision of IEEE C57.12.60 and not IEC 61857-1. There was then much discussion of the actual testing. A range of issues were discussed, including physical matters underlying the performance of the test, whether testing was being performed in an unrealistic regime (e.g., there is breakdown on the surface when you wouldn't operate your transformer in that state) internal and external phenomena, internal versus external breakdown, and whether these matters were related to processing or design.
- Joseph Tedesco pointed out that IEEE 259 is an international standard, not just a UL standard. The only reason a company would go to UL is if they were seeking certification. Not everyone is doing this, so we need to allow for anyone to use IEEE 259

if it is appropriate for their situation. Casey Ballard then pointed out that UL 1562 (for MV transformers) ultimately references IEEE 259 through other standards. Ed then stated that IEEE C57.12.60 could reference IEEE 259, even if it had been withdrawn, reminding everyone that it had been done before. If there was no interest in working on the standard, then put a date in the text of IEEE C57.12.60 (i.e., IEEE 259: 1999) and be done with it. He was adamant that we shouldn't work on the standard unless the plan was to improve it. Dave Stankes then asked whether we should spend the time fixing a standard if no one will use it.

- Tim-Felix Mai described how his company would handle certifying insulation systems. If they had a MV coil and a LV coil, they would test both using C57.12.60. Casey Ballard was unable to think of a technical reason why tests performed on a 1.2 kV class coil would not work for a 600 V class coil. Ed van Vooren pointed out that the existing published version of IEEE C57.12.60 (published in 2009) did not list voltage in either the title of scope. Roger Wicks and Casey Ballard stated that the new revision did include voltage in the scope, but the scope was copied straight from IEEE C57.12.01.
- Casey Ballard and Roger Wicks discussed options for C57.12.60.
 - Delay C57.12.60 by revising the PAR to include testing in the IEEE 259 scope, thus negating the reason for including IEEE 259.
 - IEEE 259 could be left in with a date on it, thus negating the reason to revise IEEE 259, since only the dated version would be referenced.
 - IEEE 259 could be left in without a date, which would be useful only if we planned to revise IEEE 259. Ultimately, this option was selected.
- Joseph Tedesco asked if changing the guidelines for what testing was called for would invalidate existing insulation systems. Casey Ballard and Ed van Vooren both stated that it would not.
- Casey Ballard asked who would support a PAR and work in revising the standard. The following people agreed to work on it:
 - Dave Stankes
 - Joseph Tedesco
 - Casey Ballard
 - Roger Wicks
 - Tim Felix-Mai
 - Ken McKinney (Ken also volunteered his absent colleague, Mark Raymond)
- Dave Stankes planned to write a PAR. IEEE 259 would be revised, improving it and modernizing it. Casey Ballard suggested that it would be appropriate to remain a task force until at least the Fall 2019 meeting and to develop the draft further before submitting the PAR, which would speed up the overall revision process.

The date of the next meeting was not set. The current meeting was adjourned at 10:48 AM.

Following the report to the SC, Dave Stankes requested (and was granted) permission by the SC to extend the Task Force in order to complete its work.

D.4 Old Business

D.4.1 Status of Standards

- The Vice Chair noted that the list of active standards along with noted board submission deadlines was available online for review.
- “Red” standards that were described as either expiring or close to expiring before SASB Expiration date included C57.12.60, C57.124, and C57.12.51. IEEE 259 and IEEE C57.16 were described as “yellow”. Chair noted that the Standards Chair will be prominently highlighting the standards that are behind schedule in his future reports to SC.
The IEEE Guide for Hottest-Spot Temp in Dry-Type Transformers has no active PA and SASB Expiration date of 12/31/23. Chair will approach Paulette Payne Powell who handled previous revision and ask if she would volunteer to lead this revision again.
- Vice-Chair noted that ANSI C57.12.55’s copyright is owned by IEEE, but has not historically been part of the revision process as it was not published by IEEE. Should the SC determine to revise it, then it would be published by IEEE and subject to the 10 year revision process.

D.4.1 Pole mounted transformers with coils and core exposed, new work item proposal

- At the last SC meeting Tim-Felix Mai made proposal that SC create a standard for pole mounted dry-type transformers that have coils and core exposed to the elements (no enclosure). Casey Ballard requested that Tim-Felix send a formal proposal and that Casey would then bring this to the main committee to determine where this work should fall. Casey reported that he brought the request to AdCom, and it was decided that this type of standard and information does not belong in the Distribution SC and , if approved, would belong in the Dry-type SC.

Tim-Felix Mai made the following motion:

I propose that the dry type SC submit a PAR for a new ‘*Standard for Overhead Non Enclosed Dry Type Distribution Transformers, 500 kVA and Smaller, High-Voltage 34500 Volts and Below; Low-Voltage, 7970/13800 Y Volts and Below*’

Motion was seconded by Joe Tedesco

Discussion: Steve Shull among others requested information regarding the type and application of the transformer in question, as it was suspected to be of a niche design. Tim thought that these types of transformers will be of a single phase design, although Casey Ballard stated that three phase were also manufactured. Casey explained that they were more prevalent in developing countries in order to discourage the stealing of oil (replacing oil filled designs) as well as being used in more environmentally conscious areas that impose penalties on “leakers”. Joe Tedesco also foresees increased market in areas of high population densities. David Walker asked Tim the proposed content of the standard, and Tim thought it would be similar to what is reported in liquid filled standard. Dhuru Patel voiced concern that there is only a small market in North America, and that it will be difficult to forecast requirements as they may be formed by only a limited amount of companies (users). Casey relinquished the podium to speak his personal opinion and suggested that the transformer type in question was of a niche design, and it may be more appropriate to include information on this type of transformer in annex of 12.01 or 12.91. Steve Shull pointed out that Casey’s recommendation was worth considering as a good start to breach this subject.

Following discussion, members of the SC voted on the motion proposed by Tim-Felix Mai with following results.

In favor: 2
Opposed: 16
Abstain: 2

Motion did not carry. Vice-Chair suggested to bring to 12.01 and 12.91, with recommendation to add information regarding this transformer to the annex during next revision.

D.5 New Business

- Vice-Chair announced that Tim-Felix Mai has agreed to be the new Dry-type SC liaison to the WG for IEEE 12.80 (definitions) to ensure that new dry-type definitions are added and that there is alignment with the other sub committees.
- Solomon Chiang posed the question asking if members of the SC should join a ballot pool for a for Dry-type standard even if not a member of the WG. Vice-Chair encouraged people to join, but stated you are not required to join especially if the standard deals with topic you are not well-versed in.
- Detlev Gross expressed concern over new copyright requirements and felt that the requirements laid out by IEEE were effective at present. Many questions and concerns were raised over this subject, but not many answers could be offered. Vice-Chair reminded the SC to be sure to attend and participate at the upcoming training sessions regarding the new copyright requirements planned by IEEE.

D.6 Adjournment

With no further business, the meeting was adjourned at 2:45 PM.

Chairman: Charles Johnson

Vice Chairman: Casey Ballard

Secretary: David Stankes

(Notes prepared by Dave Stankes)