Annex D Dry Type Transformers Subcommittee

October 21, 2020

Virtual Meeting

Chair: **Casey Ballard**

Vice-Chair: **Vacant**

Secretary: **David Stankes**

D.1 Introductions and Approval of Agenda and Minutes

The Subcommittee met virtually on October 21, 2020 at 12:55PM.

No individual introductions were made, but Chair remined participants to announce one's name and affiliation prior to speaking at this virtual meeting.

The meeting was convened with 47 people in attendance. 23 of the 31 members of the Dry Type Subcommittee were present, so quorum was reached. Seven guests requested membership. Three will be granted membership as they have met meeting attendance and participation requirements. The attendance roster will be recorded in the AMS.

The Chair displayed the proposed agenda that had been previously sent to the group. He also reminded attendees that the unapproved minutes from the last Dry type Transformers Subcommittee (DTSC) meeting that was held (Fall 2019 in Columbus) had been posted to the IEEE TC website. He asked if there were any objections to the unanimous approval of the agenda as well as the unapproved meeting minutes from Columbus. Hearing none, both the agenda and the unapproved Fall 2019 DTSC meeting minutes were approved.

D.2 Chairs Remarks

Chair congratulated WG and TF leaders for effectively reviewing IEEE copyright policy prior to start of meeting and appreciated those who sent this information out early to attendees to save time at meeting. He reminded attendees that within the DTSC and the broader Transformers Committee we are allowed to share any IEEE document or draft freely. Caveat is that for external copyright material that IEEE has approval to use, we must request permission for each document that may plan to use it. Also reminded group that we must get copyright approval in advance of sharing or displaying any non- IEEE document. This can be addressed by using the request form found on the IEEE website. Any questions may be directed to Casey Ballard, Ed teNyenhuis, or Malia Zaman.

Chair noted that there was no change in the DTSC membership since the last meeting.

Encouraged Task Force and Working Groups to conduct meetings between the Fall and Spring meeting sessions. Invitations and agenda should be shared a minimum of one month in advance, and good idea to post these on meetings page of SC website (Sue McNelly can help post). It is also required to record attendance in the AMS as well as record minutes. There are licenses of WebEx available from IEEE should you need one to host a virtual meeting.

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

Chair reminded WG chairs to keep rosters up to date and reviewed guidelines for membership.

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

- SA Ballot process has been completed
- Casey is communicating with IEEE editor to correct some minor typos's but nothing will be changed that will affect the technical content of the document.
- Expect that the document will be published in 2021.
- Plan to meet at Spring 2021 meeting as a Task Force to begin PAR submission process as part of the decision to maintain 12.01 as a continuous revision document.

D.3.2 Revision of IEEE PC57.12.91 - Standard Test Code Chair David Walker

- SA Ballot process has been completed. Approved by Revcom and now in editing stage.
- Plan to meet at Spring 2021 meeting as a Task Force to begin PAR submission process as part of the decision to maintain 12.01 as a continuous revision document.
- Comments received during balloting process will be reviewed to help develop topics that may be addressed during the next revision cycle.

D.3.3 IEEE PC57.16 – Dry Type Reactors Chair Art Del Rio

The working group for the revision of C57.16 met virtually in WebEx on Monday October 19, 2020, at 9:10 AM.

1. 1. Introductions and Call for Patents

- The meeting was called to order at 9:10 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 and copyrights issues as slides sent in advance in meeting invite. None were reported.

2. Verification of Quorum

- The attendance was checked with a Poll.
- There was a total of 38 participants: 9 Members and 29 Guests out of which 4 guest requested membership. None granted based on attendance.
- 9 of the current 15 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 Oct 17, 2020 by email, was presented to the participants.
- There were no objections or comments and the agenda was approved unanimously.

3. Approval of the minutes of the October 28, 2019, meeting in Columbus, OH, Ohio.

- The minutes from the F19 meeting in Columbus, which were circulated on October 17, 2020 by email, were presented to the participants.
- There were no objections or comments and the minutes were approved unanimously.

4. Continue to discuss and review

- Dave Caverly gave a presentation regarding the latest activities of the Liaison Task Force with the Switchgear Committee on this Standard.
- We have got good support from the Switchgear Committee and the general opinion from them is that we are on the right track.
- Next actions are:
  - Make further progress on Annex B & B-1 by end of 2020
  - Circulate, get input from anyone interested to contribute within Switchgear & Transformers Committees.
  - Feb/March 2021: Send for email ballot within Switchgear LTF re readiness to go to format ballot in Transformers Committee and SA.

4.a Annex B - Dry-type air-core shunt capacitor reactors. Update on TF from Switchgear Committee

- Dave Caverly presented the latest draft.
- Make minimal changes to the existing Normative Annex B
- Add an additional Informative Annex, e.g. Annex B-1 "Application and Rating Aspects of Shunt Capacitor Reactors (TLI's)"
  Something less than an Application Guide, but more than a typical standard in terms of applications information, "what is behind the ratings" "tutorial like".
- Describe the basic issues and what is behind them, outline the evolving nature, and then point to specific switchgear documents to get the current information.

4.b Annex B1 – Informative. Supplementary to Annex B

- Dave Caverly presented the latest draft.
- Proposed title: Application and Rating Aspects of Shunt Capacitor Reactors (LTI’s).
- Pierre Riffon pointed out that it is still a lot of material around the factor I time f, which is only valid for oil type circuit breakers and not for modern types of circuit breakers (e.g. SF6 and Vacuum). IEC and Cigré are going away for the I times f factor and instead talk about the inrush current integral for definition of the arc energy.
- Dave Caverly fully agreed that the I*f is going away – but that is the whole point of the historical review – to explain the evolving history for the many people, especially non-switchgear people, who may not know or understand it.

4.c Annex F - System considerations, TRV section update; feedback from Switchgear Committee

- Dave Caverly presented the latest draft.
- This Annex has been sent to the Switchgear Committee LTF for comments. Only one comment has been received and some more should come.
- Pierre Riffon pointed out that the location of the reactor can have a huge impact on the rating of the circuit breaker, i.e. if located at the source side then a CB with lower short circuit current rating can be selected.
- Dave Caverly agreed with the point and will endeavor to make some improvements

4.d PI Model: During previous meetings of the LTF with Switchgear, the topic of modelling of the reactor for transient studies was raised. (principally in respect of TRV studies, but perhaps not only that, (maybe also Lightning and high frequency harmonics calculations.)). Switchgear

folks would like to have the key modelling info readily available rather than having to request and dig for it, each and every time.

(This discussion is not specific to TLI's but rather was raised in the Switchgear LTF in the context of all series reactors and even shunt reactors. It is a general reactor issue.)

Various ideas were discussed in the Switchgear meeting and also in our F19 Columbus meeting, such as putting the data on the nameplate or drawing, or test reports. Until this Fall 2020 Transformers meeting however, no clear conclusion had been arrived at. One issue that has been recognized is that the key elements of a PI model include internal construction information which is available only to the manufacturer (eg. series capacitance of the winding), but also stray capacitance to ground which depends on mounting height - which the manufacturer may not know. So at least some of the time, no-one has all the information.

In addition to the above, a further issue that was briefly discussed is that the information in respect of modelling is often needed by the User far before an order is placed or a test report received. Rather such information is often needed in the planning and early budgetary quotation stage.

In this meeting Dave Caverly presented the idea of defining a standard simple PI model and associated standardized data table in the standard, along with a standard formula for stray capacitance to ground calculation and a standard formula for coil first parallel resonance frequency based on the stray capacitance to ground and supplier provided internal figures (eg. Series capacitance). The concept of this approach would be to facilitate a simple, clear and efficient data exchange between Supplier and User in the planning stage.

- Dave Caverly made a motion, which was seconded by Klaus Pointner, that we should develop specific language, model and table in line with the above concept and include- this at a suitable location (to be decided) within the standard (C57.16), the notion being that it is applicable to all series reactors. The result of the Poll was:
  For: 8
  Against: 0
  Abstain: 1

5. New Business

- There were no new business.

6. Adjournment

- The meeting was adjourned at 10:31 AM.

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

Annex D

Attendee list from IEEE PC57.16 Fall 2020 WG Meeting						
	First Name	**Last Name**	**Company**	**City**	**State**	**Country**
Guest	Stephen	Antosz Jr.	Siemens Industry	NewKensington	PA	USA
Guest	Edmundo	Arevalo	BPA	Vancouver	WA	USA
Guest	Israel	Barrientos	Prolec GE	Apodaca	Other	Mexico
Guest	Steven	Brzoznowski	BPA	Vancouver	WA	USA
Member	David	Caverly	Trench Limited	Scarborough	ON	Canada
Guest	Solomon	Chiang	The Gund Company	Fergus	ON	Canada
Chair	J. Arturo	Del Rio	Siemens Energy	Raleigh	NC	USA
Guest	Jonathan	Deverick	Dominion Energy	Richmond	VA	USA
Member	Alexander	Gaun	Coil Innovation GMBH	Eferding	Other	Austria
Guest	Kendrick	Hamilton	Power Partners, Inc.	Athens	GA	USA
Guest	Kenneth	Hampton	Baltimore Gas & Electric	Baltimore	MD	USA
Guest	Ramadan	Issack	American Electric Power	Columbus	OH	USA
Guest	Jeremy	Johnson	Intermountain Electronics	Price	UT	USA
Guest	Kurt	Kaineder	Siemens Energy	Leonding	Other	Austria
Guest	Dmitriy	Klempner	Southern California Edison	Pomona	CA	USA
Guest	Axel	Kraemer	Maschinenfabrik Reinhausen	Regensburg	Other	Germany
Guest	Colby	Lovins	Federal Pacific Transformer	Bristol	VA	USA
Guest	Ross	McTaggart	Trench Limited	Pickering	ON	Canada
Guest	Martin	Munoz Molina	Orto de Mexico	Cuernavaca	Other	Mexico
Guest	Joe	Nims	Allen & Hoshall, Inc.	Nashville	TN	USA
Member	Sylvain	Plante	Hydro-Quebec	Montreal	QC	Canada
Guest	Christoph	Ploetner	Hitachi ABB Power Grids	Bad Honnef	Other	Germany
Member	Klaus	Pointner	Trench Austria GmbH	Leonding	Other	Austria
Secretary	Ulf	Radbrandt	Hitachi ABB Power Grids	Ludvika	Other	Sweden
Guest	Juan	Ramirez	CELECO	Apodaca	Other	Mexico
Member	Pierre	Riffon	Pierre Riffon Consultant Inc.	Longueuil	QC	Canada
Guest	Patrick	Rock	American Transmission Co.	Amherst	WI	USA
Member	Devki	Sharma	Entergy	Halifax	NS	Canada
Member	Michael	Sharp	Trench Limited	Scarborough	ON	Canada
Guest	Kunal	Shukla	PECO Energy Company	Philadelphia	PA	USA
Guest	Audrey	Siebert-Timmer	IFD Corporation	Vancouver	BC	Canada
Guest	Adam	Smith	Commonwealth Associates	Jackson	MI	USA
Guest	Kerwin	Stretch	Siemens Energy	Erlangen	Other	Germany
Guest	Neil	Strongosky	Memphis Light Gas & Water	Memphis	TN	USA
Guest	William	Whitehead	Siemens Energy	Raleigh	NC	USA
Guest	Alexander	Winter	HIGHVOLT Pruftechnik	Dresden	Other	Germany
Guest	Baitun	Yang	R.E. Uptegraff	Scottdale	PA	USA
Guest	Malia	Zaman	IEEE	Piscataway	NJ	USA

Co-Chairman: Tom Prevost
Co-Chairman: Rick Marek
Secretary: Hemchandra Shertukde

Meeting (virtual) was called to order on 10/20/20 at 9:00 am EST with agenda displayed by Chair.

Membership poll started at 9:03 am. Poll results:
Members 19/39
Guests 12/39
Guest seeking membership 6/39
No consideration 2/39
Total attendance 39
We have 23 members of this WG so quorum was achieved at 19/23

Agenda was approved unanimously after motion to do so made by Charles Johnson and seconded by Tim-Felix Mai.

Unapproved minutes from Columbus meeting were approved unanimously after motion to do so made by Charles Johnson and seconded by Detlev Gross.

Call for patents and Copy right policy was displayed- There was no response on the call for patents from attendees.

Scope of the Guide was revisited to start updates from different task forces:

TF 1 Normative and References, Definitions - Casey Ballard
No work done yet as no input from the other TFs

TF 2 PD Detection Systems and Test Procedure - Detlev Gross
The present draft of WG C.57.113 has been adopted for Dry-Type transformers. Those changes/deletions presented. The highlighted material is proposed to be changed/deleted for this WG's work. This discussion ended at 9:47 am. The working draft will be shared with all attendees by the Chair.

TF 3 - Annexes - Raja Kuppuswamy
No draft for this work available yet. The annex will focus on measurement impedance. Raja was asked to provide one by next meeting. Which he agreed to.

TF 4 Bibliography Jagdish Burde/Joe Tedesco
Joe Tedesco indicated that he has not been able to get in touch with Jagdish since Fall 2019 meeting. He was not on call for this meeting. Joe was requested to be the next chair of this TF. The chair will contact Jagdish to ask if he plans to continue to participate in this project.

New Business
PAR Extension - Casey Ballard pointed out that the PAR for this project will expire at the end of 2021. A motion was made by Detlev Gross and seconded by Casey Ballard to request a PAR Extension for 2 yrs. Motion approved. Further action to be taken by chair.

Old Business - None

Meeting adjourned at 10:13 am

Next meeting: April 27, 2021 Toronto, Ontario Canada

Respectfully submitted
Hemchandra Shertukde, Ph.D. P.E.
Secretary, WG C.57.124

Attendance C.57.124 Fall 2020 Meeting

First Name	Last Name	Company
Thomas	Prevost	Weidmann Electrical Technology
Subhas	Sarkar	Virginia Transformer Corp.
Emilio	Morales-Cruz	Qualitrol Company LLC
Alain	Bolliger	HV TECHNOLOGIES, Inc.
Richard	Marek	Retired
Reto	Fausch	RF Solutions
Charles	Johnson	Hitachi ABB Power Grids
Klaus	Pointner	Trench Austria GmbH
Oleg	Roizman	IntellPower Pty Ltd
Mohammad	Iman	MGM Transformer Company
Roger	Wicks	DuPont
Hemchandra	Shertukde	University of Hartford
David	Stankes	3M
Vijay	Tendulkar	Power Distribution, Inc. (PDI)
Robert	Ballard	DuPont
Shawn	Nunn	Hitachi ABB Power Grids
Ali	Naderian	Metsco
Saurahb	Ghosh	Transformers & Rectifiers (India) Ltd
Ronald	Hernandez	Doble Engineering Co.
Detlev	Gross	Power Diagnostix
Kerwin	Stretch	Siemens Energy
David	Larochelle	NDB Technologies
Solomon	Chiang	The Gund Company
Piotr	Blaszczyk	Specialty Transformer Components LLC
William	Larzelere	Evergreen High Voltage
David	Walker	MGM Transformer Company
Tim-Felix	Mai	Siemens Energy
Trevor	Mattson	Schweitzer Engineering Labs
Juan Pablo	Andrade Medina	Olsun Electrics Corporation
Dominique	Bolliger, Ph.D.	HV TECHNOLOGIES, Inc.

Stephen	Antosz Jr.	Siemens Industry
Raja	Kuppuswamy	Dynamic Ratings, Inc.
Janusz	Szczechowski	Maschinenfabrik Reinhausen
Ken	Klein	Grand Power Systems
Joseph	Tedesco	Hitachi ABB Power Grids
Sergio	Hernandez Cano	Hammond Power Solutions
Colby	Lovins	Federal Pacific Transformer
Brian	Sonnenberg	Instrument Transformers, LLC
Moonhee	Lee	Hammond Power Solutions
Joaquin	Martinez	Siemens Energy
Chris	Powell	Intermountain Electronics
Jeremy	Johnson	Intermountain Electronics
Jaroslaw	Chorzepa	ABB Inc.
Olle	Benzler	Megger
Hossein	Nabi-Bidhendi	ABB Inc.
Jacques	Vanier	Electro Composites (2008) ULC

D.3.5 IEEE PC57.12.52 – Task Force for Sealed Dry-Type **Chair Joe Tedesco**

The Task Force met in virtually at 8:45am PDT, Monday, October 19, 2020 over Webex. The meeting was called to order at 8:47 AM by Chairman Joseph Tedesco.

A poll was taken for people to request membership. Of 15 people present 10 requested membership. A quorum was automatically present.

The agenda was approved unanimously.

Minutes from Fall 2019 meeting were approved unanimously.

Patent call was given. Slides were sent out before the meeting. Nobody responded to patent call.

Old Business:
PAR accepted at 3/5/20 NESCOM meeting. Expires on 12/31/2024. Official title is Standard for Sealed Dry-Type Distribution and Power Transformers.

Colby Lovins and Shawn Nunn compared C57.12.51 and current revision of C57.12.52 to see if there possible changes to C57.12.52 that would make it similar to C57.12.51.

C. Lovins- compared text in first half of 12.51 and 12.52. Normative references and abbreviations are different. Are the differences necessary? Section 5.1 – kVA ratings. 12.51 refers to 12.01. 12.52 defines standard kVAs and has more exceptions and tables of ratings. Insulation Levels- 12.51 refers just to line terminal insulation. 12.52 – refers to line and neutral separately. Angular displacement is similarly more detailed in 12.52 than 12.51. Impedance was removed from 12.51 but is currently in 12.52.

S. Nunn- Construction- 12.51 refers to 12.01, 12.52 has own explanation. Connection location- 12.51 moved to section 10 and added much more discussion than 12.52. LV neutral- 12.52 requires a terminal. 12.51 allows direct ground connection or a terminal. 12.52 has specific ground pad construction details. These were removed from 12.51. Testing- slight wording differences. Temperature conditions (temperature rises and insulations systems) 12.51 refers to 12.01. 12.52 refers to 12.01 but adds additional restrictions. Other editorial changes shown in the presentation. Current transformers- mainly differences in grammar except for 12.51 requiring that shorting terminal blocks need to be rated for the appropriate CT current.

Casey Ballard commented that requiring HV voltage taps may not be necessary and should be optional rather than required as is currently in 12.52. Chuck Johnson asked if there was TF discussion in previous meetings about adding new things that are not currently in 12.52. J. Tedesco commented that the inclusion of insulating gasses other than air or nitrogen was discussed and then dropped due to lack of expertise in any other gasses. C. Johnson also suggested that adding information like the compromise method of temperature test that are specific to sealed transformers should be considered. D. Walker asked if the standard ought to specify particular test methodologies or not. Tabled until we get to that section in the future.

New Business:

Normative References- Chair proposed that the existing list of references is appropriate.

D. Walker suggested that editorial changes don't need approval except as a red lined standard draft and there is not a need for a motion on every change. C. Ballard suggested similarly.

Discussed generalizing discussion of clause 5.1. Chair introduced a suggestion. D. Walker and C. Johnson suggested simplifying the proposal to be more readable. Discussed that 12.52 currently has GA as the cooling class and the new version of 12.01 will use GNAN. Will change 12.52 to match 12.51. T. Mai will also talk to 12.80 WG about updating the definition from GA to GMAN to match 12.01.

Discussions of preferred kVA and voltage ratings. C. Johnson felt that this product has inherent limitations that are reflected in the table and it does not prevent manufacturers from using other values. D. Walker suggested the table be deleted and use the information in 12.01. C. Johnson did not agree. Chair to put proposal in red-lined draft.

Chair reviewed several proposed wording changes in various sections of the standard. Chair will send out a red lined draft.

Chair adjourned meeting at 10:00 am.

The Working Group will meet again at the Spring 2020 meeting in Toronto, ON, CA.

Chairman: Joseph Tedesco

Secretary: David Walker

Subgr	Role	Type	First Nam	Last Name	Company	10/19/20
C57.12.52	Member	Active Participant	Juan Pablo	Andrade Medina	Olsun Electrics Corporation	X
C57.12.52	Guest	Interested Individual	Onome	Avanoma	Transformer Consulting Services Inc.	
C57.12.52	Member	Committee Member	Robert	Ballard	DuPont	X
C57.12.52	Member	Active Participant	Mirvil	Bruno	ABB Inc.	
C57.12.52	Guest	Interested Individual	Lucas	Coffey	Alabama Power	
C57.12.52	Guest	Active Participant	Florin	Faur	SPX Transformer Solutions, Inc.	
C57.12.52	Member	Committee Member	Derek	Foster	Magnetics Design, LLC	
C57.12.52	Member	Interested Individual	Bob	Fyrer	DuPont	
C57.12.52	Guest	Active Participant	Kenneth	Harden	Schneider Electric	X
C57.12.52	Member	Interested Individual	Sergio	Hernandez Cano	Hammond Power Solutions	X
C57.12.52	Member	Committee Member -	Charles	Johnson	Hitachi ABB Power Grids	X
C57.12.52	Guest	Interested Individual	Jeremy	Johnson	Intermountain Electronics	X
C57.12.52	Guest	Active Participant	Ken	Klein	Grand Power Systems	
C57.12.52	Guest	Interested Individual	Kyle	Knous	EATON Corporation	X
C57.12.52	Member	Active Participant	Colby	Lovins	Federal Pacific Transformer	X
C57.12.52	Member	Committee Member	Tim-Felix	Mai	Siemens Energy	X
C57.12.52	Member	Committee Member	Jerry	Murphy	Reedy Creek Energy Services	
C57.12.52	Guest	Committee Member	Ali	Naderian	Metsco	
C57.12.52	Guest	Committee Member	Aniruddha	Narawane	Power Distribution, Inc. (PDI)	
C57.12.52	Guest	Interested Individual	Nikoi	Nikoi	IEEE	
C57.12.52	Member	Interested Individual	Shawn	Nunn	Hitachi ABB Power Grids	X
C57.12.52	Member	Active Participant	Dhiru	Patel	Retired	
C57.12.52	Guest	Committee Member	Poorvi	Patel	Electric Power Research Institute (EPRI)	
C57.12.52	Guest	Interested Individual	Chris	Powell	Intermountain Electronics	X
C57.12.52	Member	Interested Individual	Manish	Saraf	Hammond Power Solutions	
C57.12.52	Member	Committee Member -	Hemchandra	Shertukde	University of Hartford	
C57.12.52	Member	Interested Individual	Justin	Shrewsbury	AMR PEMCO	
C57.12.52	Guest	Interested Individual	Adam	Smith	Commonwealth Associates, Inc.	X
C57.12.52	Member	Committee Member	David	Stankes	3M	X
C57.12.52	Guest	Interested Individual	Kerwin	Stretch	Siemens Energy	
C57.12.52	Chair	Active Participant	Joseph	Tedesco	Hitachi ABB Power Grids	X
C57.12.52	Member	Committee Member -	Vijay	Tendulkar	Power Distribution, Inc. (PDI)	
C57.12.52	Secretary	Committee Member	David	Walker	MGM Transformer Company	X
C57.12.52	Guest	Interested Individual	Kwasi	Yeboah	GE Energy Management	
C57.12.52	Member	Interested Individual	Robert	Zaretsky	Sargent & Lundy	

D.3.6 IEEE 259 – Low Voltage Thermal Aging Chair David Stankes

Chair: David Stankes
Vice-Chair: Joseph Tedesco

This was the third meeting of the task force, and the first that was not an ad hoc meeting. The task force meeting was held in the WebEx Session 5 meeting space during the Virtual Meeting and was called to order at 3:51 PM on 10/19/20.

There were 19 people present in the meeting. There were 5 members and 14 guests. 4 guests requested membership. The task force has 6 members; therefore, with 83%, a quorum was achieved, and business could be conducted.

There was unanimous approval of the agenda and the minutes from the Fall 2019 meeting. The patent and copyright policy were discussed, and a request was made for essential patents, but no one had any.

Old Business:

- Dave Stankes provided an update on the status of the PAR. It had been reviewed and approved by Jim Graham, and was submitted to NesCom for review at the next meeting.

- Dave gave a brief overview of how IEEE 259 got to do this point: it was going to be withdrawn due to lack of use, but it was discovered that it was still referenced by IEEE C57.12.60, and the subcommittee then voted to form a task force to revise it.
    - At the first task force meeting, the membership discussed whether they wanted to "do the standard justice" and make a serious revision to bring IEEE 259 up-to-date, and the members agreed to do so.

New Business:

- Dave introduced Draft 1 to the task force.
    - He discussed how he and Joe Tedesco had worked on it, with the development being helped by initial feedback from a small team.
    - He discussed his plan to divide Draft 1 into sections and solicit volunteers to help with the different sections. Experts on electrical insulation systems and insulation system testing would be good, but anyone knowledgeable in transformer design and/or insulation materials would be welcome.
- Discussion began regarding the Draft and the plans for the standard.
    - Roger Wicks asked about the maximum voltage range. He suggested that it would be good to keep from conflicting with IEEE C57.12.60, which has 601 V as its minimum.
    - Annirudha Narawane and Vijay Tendulkar mentioned that 660 V and 690 V are both common, and that IEC has a 1.1 kV class.
    - Vijay proposed using 1.2 kV class instead of 600 V.
    - Dave brought up how he wanted the experts to work on test procedures and aging temperatures.
        - He asked Roger to contribute his expertise from IEEE C57.12.60, and assist in addressing the discrepancies in thermal classes between IEEE 259 and IEEE C57.12.60.
        - He also was interested in adding the proof testing from IEEE C57.12.60.
    - Dave discussed improving the section regarding interpretation of data.
    - Dave also described one of the reasons that IEEE 259 was not used was because most such testing was performed pursuant to UL 1446.
        - He thought it might be possible to incorporate parts of UL 1446 into IEEE 259.
    - Casey Ballard asked what was the plan?
        - Was the plan to cover all the sections in the meetings only?
        - Or was the plan to work in small task forces to work on the sections outside the meetings?
        - Dave planned to parse out the work to smaller task forces,
            - Casey agreed that this was a good plan.
                - Time will be working against the revision, so splitting up the work allows it to move forward more quickly, which is good.

- Casey stated that it should be acceptable to also have the task force members report at the first working group meeting, which will presumably be in Spring 2021.

- Dave asked Casey about how to involve experts that had expressed an interest in participating but were either retired or not IEEE members.
  - Casey speculated that there might be ways to make that happen, and he would investigate them.

The date of the next meeting was not explicitly set, but it would most likely be part of the Spring 2021 meeting on April 26 or 27, 2021. That meeting will be in either Toronto, Canada or virtually.

The current meeting was adjourned at 4:46 PM.

Attendee List	
Moonhee Lee	**Hammond Power Solutions**
Jeremy Johnson	**Intermountain Electronics**
Vijay Tendulkar	**Power Distribution, Inc. (PDI)**
Joseph Tedesco	**Hitachi ABB Power Grid**
Ken Klein	**Grand Power Systems**
Aniruddha Narawane	**Power Distribution, Inc. (PDI)**
Roger Wicks	**DuPont**
Chuck Johnson	**Hitachi ABB Power Grids**
Colby Lovins	**Federal Pacific**
Brian Sonnenberg	**Instrument Transformers, LLC**
Rick Marek	**Retired**
Shawn Nunn	**Hitachi ABB Power Grid**
Kenneth Harden	**Schneider Electric**
Casey Ballard	**DuPont**
Juan Pablo Medina	**Olsun**
Tim-Felix Mai	**Siemens**
Roger Wicks	**DuPont**

D.3.7 IEEE C57.134 Chair Colby Lovins

The working group met on Monday, October 19, 2020 via webex on Group Session 4.

The meeting was called to order at 2:20 PM by Chairman Colby Lovins.

Chairman made opening comments.

The meeting was convened with 23 participants, 15 requesting membership and 7 guests. Being the first meeting, Quorum was reached.
Agenda was approved.
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.
The chair made a copyright issues request and showed the copyright slide; no copyrights claims were made.

Old Business

- None being this our first meeting.

New Business

- Proposed Title
  - Discussions on adding "Distribution and Power" to the Title for the purpose of being consistent with C57.12.01.
  - Casey B. proposed the motion to use the Proposed Title "IEEE Guide for Determination of Hottest-Spot Temperature in Dry-Type Distribution and Power transformers. Motion was second by Chuck J. Motion was approved unanimously.

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- Proposed Scope
  - Discussions on the proposed scope regarding the deletion of the IEC 60076-11 reference as well as deleting the exclusion of converter transformers. Discussions lead to a motion by Chuck J. to accept the proposed Scope: "This guide describes methodologies for determination of the steady-state winding hottest-spot temperature in dry-type distribution and power transformers. This guide applies to all dry-type transformers, including those with ventilated, sealed, solid cast, and encapsulated windings expect transformers described as exceptions in IEEE Std C57.12.01.".
  - Motion was second by Vijay and approved unanimously.
  - The group mentioned that the deletion of the exclusion of converter transformers, should be discussed in further meetings to properly address issues regarding this and other type of transformers where heavy harmonic loads are present.
- Proposed Purpose
  - Discussions on the proposed purpose regarding the deletion of the first sentence on the existing purpose description. The group agreed that the sentence should live somewhere in the document. After further discussion, it was proposed to move the sentence to the Introduction section of the document, as well as into including section 1.3 with the sentence to make sure it was not missed.
  - A motion was proposed by Casey B. to remove the sentence "Assumptions regarding the relation of winding hottest-spot temperature rise to average winding temperature rise are not representative of all dry type transformer constructions and winding size." from the original purpose and move it to the Introduction section as well as to include it as section 1.3 in the document. Motion was second by Juan Pablo Medina and approved unanimously.
- Submit to PAR
  - A motion was proposed by Roger W. to submit to PAR. Motion was approved unanimously.

- Chair final remarks.

Attendees:

Last Name	Frist Name	Company	Role
Andrade Medina	Juan Pablo	Olsun Electrics Corporation	Secretary
Ballard	Robert	DuPont	Member
Doak	Eric	D4EnergySolutions LLC	Member
Ghosh	Saurahb	Transformers & Rectifiers (India) Ltd	Member
Haas	Michael	Instrument Transformers, LLC	Guest
Harden	Kenneth	Schneider Electric	Guest

Johnson	Charles	Hitachi ABB Power Grids	Member
Johnson	Jeremy	Intermountain Electronics	Guest
Klein	Ken	Grand Power Systems	Member
Lee	Moonhee	Hammond Power Solutions	Member
Levin	Aleksandr	Weidmann Electrical Technology	Member
Li	Yaquan (Bill)	BC Hydro	Guest
Lovins	Colby	Federal Pacific Transformer	Chair
Mai	Tim-Felix	Siemens Energy	Member
Martinez	Joaquin	Siemens Energy	Guest
Neder	Frank	Trench Germany GmbH	Guest
Nunn	Shawn	Hitachi ABB Power Grids	Member
Powell	Chris	Intermountain Electronics	Member
Sonnenberg	Brian	Instrument Transformers, LLC	Guest
Stankes	David	3M	Member
Tedesco	Joseph	Hitachi ABB Power Grids	Member
Tendulkar	Vijay	Power Distribution, Inc. (PDI)	Member
Wicks	Roger	DuPont	Member

With no further business, the meeting was adjourned at 3:35 PM.

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

Chairman: Colby Lovins
Secretary: Juan Pablo Medina

D.3.8 IEEE C7.96 Chair Aniruddha Narawane

Virtual Meeting 19/20/20 by WEBEX, 12.55 pm to 2.10 pm CST
Chair: Aniruddha Narawane
Vice Chair: Iman Mohammed
Secretary: Kerwin Stretch
Meeting called to order at 12:55 by the Chair

- All participants were notified that the meeting was being recorded for the purpose of taking notes but would be deleted after the meeting minutes are completed.
- The chair presented the information on Patent Disclosures and asked the group to report any relevant patent issues – None were communicated.
- Poll for membership taken at 13:00
    - 26 total persons present
    - 18 guests requesting membership
    - 7 requested to remain in guest status
    - 1 attendee did not respond

- As this was the first meeting of the TF, a quorum was established based on this poll
- Agenda for the meeting was approved unanimously without discussion
- The chair proposed that one motion for approval of the Title, Scope, and Purpose of the TF be held after the discussion and editing of all three sections.
- Title for the Task Force was shown for discussion
    - After some discussion it was agreed that it was not necessary to list exclusions for special types in the title. This will be handled in the body of the text.
    - Decision taken to remove "Draft" from the title. It was noted that this would have happened automatically and replaced by "IEEE" as part of the submission process.
- Scope for the Task Force was shown for discussion
    - It was inquired if we should reference that the guide would apply to transformers covered in C57.12.01. After some discussion it was agreed that the Scope should be as broad as possible to allow flexibility.
    - a question was raised regarding the application of the loading guide to 600V transformers. Discussions among participants indicated that this topic was never raised in the past and the guide is intended for 1.2 kV class and above. However, there is nothing stopping its application on 600 V provided there is agreement between the manufacturer and customer.
    - The TF should consider how the guideline will be aligned with 259 (the companion to C57.12.60)
- Purpose for the Task Force was shown for discussion
    - Many discussions took place regarding the removal of the word "risk" from the purpose. In the end it was decided to remove both "risk" and "consequence". The new text, agreed by the members, is as follows –
      "Guidance is also provided for assessing the effects of loading above nameplate rating."

- Casey Ballard made a motion to approve the Title as shown on slide 5, the scope on slide 6, and the purpose shown on slide 7 using the modified text. Motion was seconded by Vijay and passed with 17 for, 0 against, and 2 abstaining.
- The remaining time in the meeting was used to discuss items for future considerations –
    - It was mentioned that it is necessary to Fix the mismatch in temperature class from 155C to 150C to align with C57.12.01
    - It was also suggested, some tables should be reviewed and evaluated if they are necessary in the future guideline.
    - Another suggestion was that C57.12.56 should be replaced by 12.60 in the normative references.
    - Additional suggestion was that we should closely follow the status of 259 and align were appropriate.
    - It was proposed that we evaluate the BASIC program shown in the Annex and suggested changing to a VBA macro for Excel or another modern programming language.
    - Also noted was that some tables should be updated to include the 240C temp class.

  - It was recommended to review and update the bibliography with any new, relevant, sources that might have been released since the previous version
- Mike Iman made a motion at 14:09 to adjourn the meeting. Motion was seconded by Vijay and passed unanimously.

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

Chairman: Aniruddha Narawane
Vice-Chairman: Iman Mohamed
Secretary: Kerwin Stretch

Attendance

Last Name	First Name	Affiliation	Status
Arevalo	Edmundo		
Ballard	Casey	DuPont	Member
Haas	Michael	Instrument Transformers, LLC	Guest
Harden	Kenneth		
Iman	Mohammed	MGM Transformers	**Vice Chair**
Johnson	Charles	Hitachi ABB Power Grids	Member
Klein	Ken	Grand Power System	Member
Lee	Moonhee	Hammond Power Solutions	Member
Lovins	Colby	Federal Pacific Transformer	Member
Mai	Tim-Felix	Siemens Energy	Member
Marek	Rick	Retired	Member
Montpool	Rhea	Schneider Electric	Member
Narawane	Aniruddha	Eaton PDI	**Chair**
Nunn	Shawn	Hitachi ABB Power Grids	Member
Andrade-Medina	Juan Pablo	Olsun Electrics Corporation	Member
Patel	Vinay	Consolidated Edison Co. of NY	Guest
Peterson	Caroline	Xcel Energy	Guest
Podany	Nick	Bureau of Reclamation	Guest
Powell	Chris	Intermountain Electronics	Member
Smith	Adam	Commonwealth Associates, Inc	Guest
Sonnenberg	Brian	Instrument Transformers, LLC	Member
Stankes	Dave	3M	Guest
Stretch	Kerwin	Siemens Energy	**Secretary**
Tedesco	Joseph	Hitachi ABB Power Grids	Member
Tendulkar	Vijay	Eaton PDI	Member
Wicks	Roger	DuPont	Member

Chairman: Aniruddha Narawane
Vice-Chairman: Iman Mohamed
Secretary: Kerwin Stretch

D.4 Old Business

D.4.1 Status of Standards

- Revisions approved for C57.12.01 and C57.12.91
- PAR Approval pending for IEEE 259
- No standards at risk of lapsing
- Next standard to be worked on has 2025 expiration (Good shape!)

D4.2 NEMA Low Voltage (LV) Standards

This topic is regarding the possibility of moving current NEMA LV documents over to IEEE.

- David Walker reported there has not been a NEMA meeting since last IEEE SC meeting, so he was not able to gauge interest of NEMA membership to have this happen. He has received some unofficial comments from NEMA indicating that this is something that they would consider.
- Casey brought this proposal up to AdCom. Their view was that it was up to the SC to decide if this is something that should be done. AdCom's main concern was IEEE having enough members to take on and maintain the new document(s).
- Casey recommended waiting until we had an official response from NEMA. If NEMA approved, we would then go the SC for a vote to determine if we should pursue bringing the NEMA LV documents into IEEE.
- Chair asked if there were any comments, questions, or suggestions from the DTSC
    - Vijay Tendulkar asked what documents we were interested in bringing into IEEE. Ken Klein said both ST-20 and possibly ST-1 were of interest. He also stated that there was a scheduled NEMA (Transformer) meeting on 10/27/20.
    - Roger Wicks asked if 1255 would also be considered. Casey explained that NEMA has already extended copyright for this document over to IEEE, but IEEE has chosen not to revise the document and it is not included in the ten-year revision cycle as it is still a NEMA document. Casey expected that any new documents we agree to bring over would not be "parked" and that we would work on and maintain under 10-year mandatory revision cycle.
    - Chuck Johnson thought we never opened 1255 due to limited resources to work on the standard. He also felt it was a somewhat limited in scope document that was used when customers required 3rd party certification. Chuck recommended that if we do work on the document, we should make sure that we include feedback from people who are using the document to make sure we don't impact a manufactures ability to obtain 3rd party certifications.
    - Casey requested an informal non-binding poll regarding "would you be interested in being part of a group that would conduct a revision of C57.1255"
      Results: 12 For, 4 Against, 12 Abstain, 16 No Response.
    - Colby Lovins informed the DTSC that the NEMA ST-20 document had been recently revised by NEMA and would not be in immediate need of IEEE revision.
    - David Walker stated that in his opinion that ST-20 would not take much effort to maintain, as many sections refer to other existing IEEE standards.

- Casey requested members who were planning to attend the 10/27 NEMA meeting ask if NEMA would be willing to share the ST-20 document for our review. Review of document may help members decide if we should pursue bringing over to IEEE.
- Joe Tedesco reminded group that ST-20 covers a wide size range including some very small transformers.
- Casey discussed a previous discussion regarding possibility of a joint IEEE/CSA document. He felt that CSA has already established documents containing excellent information on enclosures.
- Vijay Tendulkar commented that ST-20 considers sound level depending on K factor whereas IEEE standards currently do not.

D.5 New Business

No new business

Chair asked members to share comments regarding how the virtual meeting went as well as suggestions on how to make the virtual meetings better. Send comments to Casey or Ed T.

Next meeting very well could be virtual depending on Covid-19 situation, otherwise next meeting will be face to face in Toronto Spring 2021.

D.6 Adjournment

With no further business, the meeting was adjourned at 2:10 PM.

Chairman: Casey Ballard

Vice Chairman: Open

Secretary: David Stankes

(Notes prepared by Dave Stankes)

Dry Type Subcommittee Attendance Fall 2020 Virtual				
First Name	**Last Name**	**Company**	**Role**	**10/21/2020**
Juan Pablo	Andrade Medina	Olsun Electrics Corporation	Member	X
Robert	Ballard	DuPont	Chair	X
Israel	Barrientos	Prolec GE	Guest	X
William	Boettger	Boettger Transformer Consulting LLC	Guest	X
David	Caverly	Trench Limited	Guest	X
Solomon	Chiang	The Gund Company	Member	X
J. Arturo	Del Rio	Siemens Energy	Member	X
Saurahb	Ghosh	Transformers & Rectifiers (India) Ltd	Guest	X
Monty	Goulkhah	Kinectrics	Guest	X
Detlev	Gross	Power Diagnostix	Guest	X
Michael	Haas	Instrument Transformers, LLC	Guest	X
Kenneth	Hampton	Baltimore Gas & Electric	Guest	X

Sergio	Hernandez Cano	Hammond Power Solutions	Guest	X
Mohammad	Iman	MGM Transformer Company	Member	X
Ramadan	Issack	American Electric Power	Guest	X
John	John	Virginia Transformer Corp.	Member	X
Charles	Johnson	Hitachi ABB Power Grids	Member	X
Ken	Klein	Grand Power Systems	Member	X
Kyle	Knous	EATON Corporation	Guest	X
Moonhee	Lee	Hammond Power Solutions	Member	X
Aleksandr	Levin	Weidmann Electrical Technology	Member	X
Colby	Lovins	Federal Pacific Transformer	Member	X
Tim-Felix	Mai	Siemens Energy	Member	X
Richard	Marek	Retired	Member	X
Joaquin	Martinez	Siemens Energy	Guest	X
Rhea	Montpool	Schneider Electric	Member	X
Jerry	Murphy	Reedy Creek Energy Services	Guest	X
Hossein	Nabi-Bidhendi	ABB Inc.	Guest	X
Aniruddha	Narawane	Power Distribution, Inc. (PDI)	Member	X
Shawn	Nunn	Hitachi ABB Power Grids	Guest	X
Stephen	Oakes	WEG Transformers USA Inc.	Guest	X
Klaus	Pointner	Trench Austria GmbH	Member	X
Chris	Powell	Intermountain Electronics	Guest	X
Thomas	Prevost	Weidmann Electrical Technology	Member	X
Ulf	Radbrandt	Hitachi ABB Power Grids	Guest	X
Michael	Sharp	Trench Limited	Member	X
Samuel	Sharpless	Rimkus Consulting Group	Guest	X
Edward	Smith	H-J Family of Companies	Guest	X
Brian	Sonnenberg	Instrument Transformers, LLC	Guest	X
David	Stankes	3M	Secretary	X
Kerwin	Stretch	Siemens Energy	Guest	X
Joseph	Tedesco	Hitachi ABB Power Grids	Member	X
Vijay	Tendulkar	Power Distribution, Inc. (PDI)	Member	X
Eric	Theisen	Metglas, Inc.	Guest	X
Parag	Upadhyay	ABB Inc.	Guest	X
David	Walker	MGM Transformer Company	Member	X
Roger	Wicks	DuPont	Member	X