Annex D Dry Type Transformers Subcommittee

May 28, 2021

Virtual Meeting

Chair: **Casey Ballard**

Vice-Chair: **Vacant**

Secretary: **David Stankes**

D.1 Introductions, Chairs Remarks and Approval of Agenda and Minutes

The Dry-type Transformers Subcommittee (DTS) met virtually on May 28, 2020 at 12:55 PM (CST).

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

The Chair displayed the proposed agenda containing some minor modifications compared to the copy that had been previously sent to the group. (Attendance and Quorum moved to later in schedule, addition of WG report on Terminology C57.12.80, addition of LV standards from NEMA in Old Business.)

The meeting was convened with 54 people in attendance. Chair was not aware of any changes in the membership of the DTS since the last meeting. 26 of the 31 members of the DTS were present, so quorum was reached. Twelve guests requested membership. Qualifications for those requesting membership will be reviewed by the Chair and Secretary. Notification e-mails will be sent to those who meet membership requirements. It was requested that new members confirm their interest in becoming members as final step before being added to the roster. The attendance roster will be recorded in the AMS.

Motions to entertain the approval of the Agenda and the Fall 2020 DTSC Meeting minutes was proposed by Chair. Both Agenda (Motion to Approve – Joe Tedesco, 2nd - Tim-Felix Mai) and Fall 2020 minutes (Motion to Approve - Colby Lovins, 2nd – Vijay Tendulkar) were unanimously approved.

Chair noted that WG and TF meeting chairs have done a good job of reviewing IEEE copyright and patent policies as part of their meetings. Chair reminded the SC that the copyright policies for sharing documents also extends to NEMA and IEC documents.

Chair encouraged the continued use of virtual meetings in addition to the Fall and Spring meetings to help projects finish on time. Reminded SC that an invitation with meeting agenda should be sent out at least 2 weeks prior to the meeting using AMS system. Invitations/agenda may also be posted on the IEEE website with assistance from Sue McNelly. Virtual meeting attendance should be recorded in AMS and meeting minutes should be made available. Please send these to both Casey Ballard and Dave Stankes so they can be included in the next meeting record submittal. A question was raised regarding how business can be conducted if a quorum at these virtual meetings is not attained. Chair commented that although binding votes may not be possible, progress can still be made. The possibility of forming smaller membership Task Forces was proposed, with TF charged with coming up with specific proposals that could be submitted to larger Working Group. Meeting platforms such as iMeet and Webex accounts are available, and Malia Zaman can help facilitate the use of these tools. Although any communication platform is acceptable, it was acknowledged that a common platform used by all may help facilitate improve productivity.

In an effort to promote diversity, equity, and inclusion the Chair requested the use of Chair and Vice Chair in meeting minutes as a replacement to previously used Chairman and Vice Chairman.

Chair informed SC that a PAR extension must be approved by both the Working Group and the DTS before it is submitted. The meeting minutes must record the details of the approval process (person who made the motion, 2nd, etc.)

Chair noted that it is very easy for a guest to request WG membership, especially during virtual meetings. He asked that before a new member is added that the requestor confirm their intent with WG Chair to actively participate in the WG activity.

Chair reminded SC that attendance must be included as part of the WG/TF meeting minutes, and that Name, affiliation, and status (Member or Guest) be included as part of this record. Members are asked to update their affiliation in AMS as needed, and to identify their current affiliation (in Chat for virtual meeting) if they are aware that their affiliation in AMS is not correct. It was requested that people log into virtual meetings with their full name as it makes it easier for Chair to record attendance.

Meeting minutes should include key discussions as well as detailed records of any motion proposals. Minutes do not need to include the names of all individuals who contribute to the discussions.

Attendees who participate in the attendance poll (virtual meetings) are to be recorded as attending meeting regardless of length of time person is logged in at meeting.

There was comment regarding attendance poll not recording attendance properly (2 individuals experienced this problem). Chair recommended reporting this problem to Bruce F. as part of post meeting review questionnaire that should be sent out in the next few weeks.

D.2 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.2.1 Revision of IEEE PC57.12.01 - Dry Type General Requirements Chair Casey Ballard

The virtual meeting on 4/26/21 was called to order at 12:55 PM CT by Chair Casey Ballard.

Chair made opening comments.

This is the first meeting of the new TF to prepare PAR request for the next round of IEEE C57.12.01 continuous revision.
The meeting was convened with 35 participants, 21 requested and granted membership. The list of attendees is presented at the end of this report. The attendance will be reported in the AMS.
Chairman requested patent disclosure, no patent claims were made. IEEE Copyright policy has been reviewed and understood.
There was no ability to approve the Agenda for the first meeting as there were no existing members.

Old Business
None.

New Business

- WG reviewed PAR: Title, Scope and Purpose.
- **Title –** proposed to be same as IEEE C57.12.01-2020 :

"Draft Standard for General Requirements for Dry-Type Distribution and Power Transformers".
It was asked whether differences between distribution and power transformers exist and shall be addressed (similar as in liquid-filled transformers as for the dielectric tests, etc.). Chair answered that this standard covers both power and distribution transformers, but doesn't differentiate between them so far and is limited to 72 kV voltage class with no limit in kVA. This topic can be discussed in more details in a work of upcoming WG.

- **Scope –** proposed to be same as IEEE C57.12.01-2020**:**

"This standard describes electrical and mechanical requirements of single and polyphase ventilated, non-ventilated, and sealed dry-type distribution and power transformers or autotransformers, with a voltage of 601 V or higher in the highest voltage winding. This standard applies to all dry-type transformers, including those with solid-cast and/or resin encapsulated windings except as follows:

- Instrument transformers
- Step- and induction-voltage regulators
- Arc-furnace transformers
- Rectifier transformers
- Specialty and general-purpose transformers
- Mine transformers
- Testing transformers
- Welding transformers"

NOTE—Where IEEE standards do not exist for the transformers mentioned above or for other special transformers, this standard may be applicable as a whole or in parts subject to agreement between the parties responsible for the application and for the design of the transformer.

- While NEMA and UL cover general purpose transformers of 600 V and below voltage, customers often referencing to C57.12.01 in their specification on such transformers. Dave thought that, as NEMA didn't show much interest in maintaining standards related to such transformers, maybe it would be appropriate to expand application of C57.12.01 to transformers below 600 V.
- It was noted that we have just removed these voltages classes from the standard (1.2 kV is the lowest class which would cover 601-1200 V and referred to NEMA in the introduction for 600 V and below).
- NEMA ST20 is sufficient and it would be no value to expand C57.12.01 to include these transformers.
- At the Spring 21 AdCom meeting, NEMA announced they are going to expand their efforts on standards development to broaden their portfolio of transformer standards and asked IEEE members to participate. There is no reason to maintain similar standards (same scope) that will require constant synchronization. Maybe by moving the reference and clarification on NEMA to the body of C57.12.01 will cover what we need.
- Confusion is between 600 V and 690 V that are of close voltage, but don't belong to the same voltage class.
- Changes of voltages would require revision of our PAR and Dry-Type SC shall be consulted. As there is TF's interest in this topic, it will be discussed in the SC meeting **(ACTION).**

- **Scope exceptions.**

- If we decide to expand down to 120 V, the exclusion of general purpose transformers shall be removed.
- Group also discussed definition of rectifier transformers and decided that drive and invertor transformers shall be specifically mentioned in the exclusion from the standard for clarity. Tim-Felix (as liason to C57.12.80) checked the definition of rectifier transformers and found that neither drive, no invertor transformers are defined in C57.12.80.
- We shall propose definitions for drive and invertor transformers to C57.12.80 before excluding them from C57.12.01 – V. Tendulkar will propose these definitions **(ACTION).** As this also related to PAR, Chair will discuss with Dry-Type SC **(ACTION).** It was noted that all changes (if any) shall be synchronized with C57.12.91.
- One more time a disagreement was expressed with expanding the scope as we could create more confusion than improvement. There are many applications for small general-purpose transformers. NEMA and UL have more information on such transformers that IEEE doesn't have – enclosures, safety, protection, etc.

- **Scope Note (part of the Scope).**

The Note is already allows to use C57.12.01 information for the group of transformers that aren't covered by IEEE standards or have a special application, in case of agreement between users and manufacturers.

At the end of the discussion, Chair concluded that we are not ready to present a PAR for approval and will request the SC to continue as TF until next Fall 2021 meeting.
WG will meet in Fall and will plan for the intermediate meeting sometime at the end of the Summer 2021. The Purpose of the Standard was not discussed.

- Chair also presented a list of potential new topics from the previous revision and the balloting process for discussion during this revision cycle and asked TF to provide additional topics of interest to include in that list. The topics included:

- Solid cast pole mounted transformers
- Environmental Requirements
  - Thermal Shock
  - Salt Fog
  - Fire Performance
- Online tap changers
- Thermal calculations for short circuit – any updates from IEC?
- 100kV class equipment
- Impulse levels pending Dielectric Test SC report
- Differentiation of Power vs Distribution transformers (like liquid filled)
- Average Ambient Temperature harmonization with IEC
- Remove the short circuit current limitation of 25 times
- Include 50Hz requirements wherever 60Hz currently appears in the document
- Synchronization with new C57.12.91 test names. Consider negative impulse to match IEC.
- Transient voltage protection technology for dry-type transformers, i.e. special accessories and their applications

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

Chair: Casey Ballard
Secretary: Sasha Levin

Meeting Participants List

First Name	Last Name	Company
Charles	Johnson	Hitachi ABB Power Grids
Mohammad	Iman	MGM Transformer Company
Derek	Foster	Magnetics Design, LLC
Vijay	Tendulkar	Power Distribution, Inc. (PDI)
Robert	Ballard	DuPont
Aleksandr	Levin	Weidmann Electrical Technology
Shawn	Nunn	Hitachi ABB Power Grids
Rob	Ghosh	General Electric
John	John	Virginia Transformer Corp.
Aniruddha	Narawane	Power Distribution, Inc. (PDI)
Kerwin	Stretch	Siemens Energy
Larry	Rebman	EMLS, Inc.
Solomon	Chiang	The Gund Company
David	Walker	MGM Transformer Company
Tim-Felix	Mai	Siemens Energy
Rhea	Montpool	Schneider Electric
William	Whitehead Andrade	Siemens Energy
Juan Pablo	Medina	Olsun Electrics Corporation
Feras	Fattal	Manitoba Hydro
Stephen	Antosz Jr.	Siemens Industry
Ken	Klein	Grand Power Systems
Caroline	Peterson	Xcel Energy
Joseph	Tedesco	Hitachi ABB Power Grids

Dervis	Tekin	Meramec Instrument Transformer Co.
	Hernandez	
Sergio	Cano	Hammond Power Solutions
Colby	Lovins	Federal Pacific Transformer
Brian	Sonnenberg	Instrument Transformers, LLC
Justin	Shrewsbury	AMR PEMCO
Moonhee	Lee	Hammond Power Solutions
Joaquin	Martinez	Siemens Energy
Manish	Saraf	Hammond Power Solutions
Chris	Powell	Intermountain Electronics
Jeremy	Johnson	Intermountain Electronics
Giovanni	Hernandez	Virginia Transformers Corporation
Muhammad	Sohail	Trench Limited

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

The Working Group met virtual on 4/27/21 via WEBEX. The meeting was called to order at 3:45 PM by Chair David Walker.

Chair made opening comments.

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.

Poll for membership:
- 22 total participants
- 18 guests requesting membership
- 4 guest

As this was the first meeting of the TF, a quorum was established.

As the vice chair is acting as secretary the chair was asking for a volunteer to be the new secretary: Rhea Montpool volunteered

The agenda was approved unanimously without discussion.

The chair presented the information on Patent Disclosures and asked the group to report any relevant patent issues – None were communicated.

Old Business
- Ballot process:
  - 161 comments
  - Editorial changes
    - Temperature rise test
    - Excitation Losses and current

New Business:
- **PAR Review**
  Proposed Scope should match C57.12.01. As there have been discussion the change the scope of C57.12.01 Casey pointed out that there will be a discussion tomorrow in the SC. New scope will be shared in the next meeting.

- **Topics for Consideration in new revision**
  - **Temperature rise test**
    - Update exponents used in eqns. 25, 26, 27 and 42 (baes on Hammond data)
    - Define “free from drafs”
    - AF Testing – Shut off fans or leave on

- **Metering phase angle correction like C57.12.90**
- **Add Scott-T figure**
- **Impulse Test**
  - Change to match C57.12.90 (rFCCFFF waves, min-nominal-max taps)
  - Change to negative polarity to match IEC dry and IEEE liquid. This must be aligned with C57.12.01 and test levels must be adjusted.
  - Define QC with rF like C57.12.90 section 10.4.2.1 Method 1
- **Short Circuit Test**
  Match with C57.12.90
- **Distribution and Power same / different**
- **Environmental**
  Fire / climatic / environmental
- **AFWF Testing WF? WF/XX?**

With no further business, the meeting was adjourned, without objection, at 5:00 PM.

The Task Force will meet again at the Fall 2021 meeting in Milwaukee, Wisconsin, October 17-21.

Chair: David Walker

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

Participation list:

First Name	Last Name	Company
William	Boettger	Boettger Transformer Consulting LLC
Charles	Johnson	Hitachi ABB Power Grids
Derek	Foster	Magnetics Design, LLC
David	Stankes	3M
Vijay	Tendulkar	Power Distribution, Inc. (PDI)
Robert	Ballard	DuPont
Shawn	Nunn	Hitachi ABB Power Grids
Aniruddha	Narawane	Power Distribution, Inc. (PDI)
Kerwin	Stretch	Siemens Energy
Kerwin	Stretch	Siemens Energy
David	Walker	MGM Transformer Company
Tim-Felix	Mai	Siemens Energy
Rhea	Montpool	Schneider Electric
Ken	Klein	Grand Power Systems
Caroline	Peterson	Xcel Energy
Joseph	Tedesco	Hitachi ABB Power Grids
Sergio	Hernandez Cano	Hammond Power Solutions
Colby	Lovins	Federal Pacific Transformer
Brian	Sonnenberg	Instrument Transformers, LLC
Justin	Shrewsbury	AMR PEMCO
Moonhee	Lee	Hammond Power Solutions
Manish	Saraf	Hammond Power Solutions
Chris	Powell	Intermountain Electronics
Olle	Benzler	Megger

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 April 26, 2021, 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 a welcome and opening remarks.
- The WG Chair, Art Del Rio, did a call for potentially essential patents. None was reported.

2. Verification of Quorum

- The attendance was checked with a Poll.
- There were a total of 25 participants: 9 Members and 16 Guests out of which 1 guest requested membership.
- 10 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 April 23, 2021 by email, was presented to the participants.
- There were no objections but one comment to change October to April. With that change, the agenda was approved unanimously.

3. Approval of the minutes of the October 19, 2020, virtual meeting

- The minutes from the F20 virtual meeting, which were circulated on April 23, 2021 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 within the Liaison with a joint TF that has been started together with the Switchgear Committee and the Transformers Committee.
- The Annexes are considered to be good in general and only a cleanup should be performed, e.g. correct formulas, figures, labels, etc.
- We should aim for Ballot this summer.

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

- Dave Caverly presented the latest draft.
- Explanation added that it is often advantageous to locate the current limiting reactor at the source side of the breaker in order to enable the use of a breaker with lower current breaking capability.
- Mike Sharp has provided text regarding mechanical short circuit test. It might not be necessary to have it in this annex since it is present in the main part of the standard.

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

- Dave Caverly presented the latest draft.
- The annex is now quite unsynched with IEC but with the latest changes it will be more synched again.
- Explanation is added that frequency and rate of rise are not critical to SF6 or vacuum breakers.

- Pierre Riffon pointed out that the peak current due to switching of adjacent banks are often smaller than the peak system fault current.
- Shankar Subramany pointed out that the inrush frequency must be considered. For capacitive banks it can often be over 3 kHz.
- Risks for mechanical resonances should be considered.
- The shunt capacitor reactor does normally have a quite low BIL level. Some kind of overvoltage protection, e.g. a MOV across the reactor. Is normally needed. This should be reflected in the Figure Y and in the text.
- Dave Caverly will do the updates with support by Pierre Riffon.

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

- Dave Caverly presented the latest draft.
- There is a request from the Switchgear Committee that we should add HF models of the reactors. Mike Sharp has added a section regarding this. The reactor should be modeled as a PI model. The capacitance to ground or mounting height should be provided by the end user since the reactor manufacturer does often not know the mounting height of the reactor. The models should be created for the frequency range of a few kHz.

5. Additional meeting

- Chair Art Del Rio will call for a supplementary Teams meeting on Monday May 10 to finalize Annex B, B-1 discussion as time run short. All WG members and guests will be invited.

5. New Business

- There were no new business.

6. Adjournment

- The meeting was adjourned at 10:35 AM.

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

Attendance list and membership status.

Role	First Name	Last Name	Company
Guest	Edmundo	Arevalo	Bonneville Power Administration
Member	David	Caverly	Trench Limited
Chair	J. Arturo	Del Rio	Siemens Energy
Guest	Thomas	Falkenburger	Coil Innovation USA, Inc.
Member	Alexander	Gaun	Coil Innovation GMBH
Guest	Andrea	Glynn	Xcel Energy
Guest	Jeremy	Johnson	Intermountain Electronics
Guest	Christopher	Lianides	Southern California Edison

Member	William	Munn	Southern Company Services
Guest	Martin	Munoz Molina	Orto de Mexico
Guest	Aniruddha	Narawane	Power Distribution, Inc. (PDI)
Guest	Paulette	Payne-Powell	Retired
Guest	Caroline	Peterson	Xcel Energy
Member	Sylvain	Plante	Hydro-Quebec
Member	Klaus	Pointner	Trench Austria GmbH
Guest	Chris	Powell	Intermountain Electronics
Secretary	Ulf	Radbrandt	Hitachi ABB Power Grids
Guest	Juan	Ramirez	CELECO
Guest	Eduardo	Ramirez Bettoni	Xcel Energy
Member	Pierre	Riffon	Pierre Riffon Consultant Inc.
Guest	Patrick	Rock	American Transmission Co.
Member	Devki	Sharma	Entergy
Member	Michael	Sharp	Trench Limited
Guest	Adam	Smith	Commonwealth Associates, Inc.
Guest	Shankar	Subramany	KEMA Labs

D.3.4 IEEE PC57.124 – Dry Type Partial Discharge Guide Chair **Tom Prevost**

WG Dry Type Transformers PD Testing
PC.57.124
Virtual Meeting
April 27, 2021
8:00 am CT (9:00 am EST)

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

Meeting was called to order at 9:00 am with agenda displayed by Chair.

Membership poll started at 9:03 am. Poll results:
Members 9/22
We have 22 members of this WG so no quorum was achieved at this time. The chair decided to continue the meeting by presenting the patent policy. No one responded to the request for essential patents.

The chair then presented the copyright policy. There was no comments or questions regarding the copyright policy.

AS there was not a quorum, the chair presented the proposed agenda and asked for comments. There were no comments, so the chair followed the agenda as distributed before the meeting.

Agenda:

- Welcome & Chairs Remarks
- Introduction of Attendees
- Quorum
- Approval of minutes from Fall, 2020
- Approval of Agenda
- Call for patents
- Review of copyright policy
- Review of Scope & Purpose
- Task Force Reports
  - Normative and References, Definitions etc. – Casey Ballard, Chair
  - PD detection Systems and Test Procedure – Detlev Gross, Chair
  - Annexes – Raja Kuppuswamy, Chair
  - Bibliography – Joe Tedesco, Chair

- New Business
- Adjourn

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. IEC 60270 is being revised so there is some coordination involved which Detlev is taking care of.

TF 3 - Annexes - Raja Kuppuswamy
Raja was not present for this meeting. Due to a change in employment is is likely that he will not be able to continue as a member of this working group. Hemchandra Shertukde will take over this task force.

TF 4 Bibliography Joe Tedesco

At 9:47 another membership poll was taken. The results were as follows:

12 members present out of 22. A quorum was achieved.

A motion to approve the agenda was made by Casey Ballard and seconded by Detlev Gross. The motion passed with unanimous approval.

A motion to approve the minutes from the Fall 2020 meeting was made by Detlev Gross and seconded by Tim Felix. The motion passed with unanimous approval.

A motion to request a two year PAR extension was made by Casey Ballard and seconded by Detlev Gross. The motion passed with unanimous approval.

New Business:

The following motion was presented by Detlev Gross and seconded by Hemchandra Shertukde….

Motion: To follow the format of PC57.113 for the PC57.124 document noting the difference between liquid-immersed transformers in a tank and dry type transformers either in or without an enclosure with the intention of having the first draft ready for the Fall 2021 WG meeting. This includes the main body and annexes.

The motion passed with unanimous approval.

Meeting adjourned at 10:15 am

Next meeting: October 19, 2021 Milwaukee, Wisconsin

Annex 1 Membership Report

Annex D

Last Name	First Name	Affiliation	Membership Status
Prevost	Thomas	Weidmann Electrical Technology	Chair
Marek	Richard	Retired	Vice-Chair
Shertukde	Hemchandra	University of Hartford	Secretary
Ballard	Robert	DuPont	Member
Bolliger, Ph.D.	Dominique	HV TECHNOLOGIES, Inc.	Member
Burde	Jagdish	Virginia Transformer Corp	Member
Caverly	David	Trench Limited	Member
Goulkhah	Monty	Kinectrics	Member
Gromlovits	Mark	EMC OEM Products Division	Member
Gross	Detlev	Power Diagnostix	Member
Hopkinson	Philip	HVOLT Inc.	Member
Iman	Mohammad	MGM Transformer Company	Member
Kraetge	Alexander	OMICRON electronics Deutschland Gr	Member
Kuppuswamy	Raja	Dynamic Ratings, Inc.	Member
Larochelle	David	NDB Technologies	Member
Larzelere	William	Evergreen High Voltage	Member
Mai	Tim-Felix	Siemens Energy	Member
Morales-Cruz	Emilio	Qualitrol Company LLC	Member
Szczechowski	Janusz	Maschinenfabrik Reinhausen	Member
Tedesco	Joseph	Hitachi ABB Power Grids	Member
Walker	David	MGM Transformer Company	Member
Wicks	Roger	DuPont	Member
Andrade Medina	Juan Pablo	Olsun Electrics Corporation	Guest
Antosz Jr.	Stephen	Siemens Industry	Guest
Attard	Jason	Consolidated Edison Co. of NY	Guest
Barnes	Jeff	Norplex-Micarta	Guest
Benzler	Olle	Megger	Guest
Bercea	Emil	Power Diagnostix	Guest
Blaszczyk	Piotr	Specialty Transformer Components LL	Guest
Bolliger	Alain	HV TECHNOLOGIES, Inc.	Guest
Brinkman	Steve	Cindus Corp.	Guest
Britton	Jeffrey	Phenix Technologies, Inc.	Guest
Brown	Chris	Tempel	Guest
Brusetti	Robert	Doble Engineering Co.	Guest
Bush	Carl	AMR PEMCO	Guest
Chiang	Solomon	The Gund Company	Guest
Chorzepa	Jaroslaw	ABB Inc.	Guest
Cumella	Arthur	NWL Transformers	Guest
Di Biase	Antonio	Tempel	Guest
Dua	Yogesh	Quality Transformers & Electronics	Guest
Etheridge	James	Kinectrics	Guest
Euvrard	Eric	RHM International	Guest
Fausch	Reto	RF Solutions	Guest
Ferreira	Marcos	Beale AFB	Guest
Ford	Gary	PowerNex Associates Inc.	Guest
Foster	Derek	Magnetics Design, LLC	Guest
Fyrer	Bob	DuPont	Guest
Gara	Lorne	Shermco	Guest
Garneau	Jean	Essex Wire	Guest
Gaun	Alexander	Coil Innovation GMBH	Guest
Ghosh	Rob	GE	Guest
Golarz	Jeffrey	PJ Associates	Guest
Gonzalez Ceballos	Jose Antonio	Meramec Instrument Transformer Co.	Guest
Goydich	Shane	Roechling	Guest
Haas	Michael	Instrument Transformers, LLC	Guest
Hammer	Mark	Jordan Transformer	Guest
Henry	Jeffery	Mapes & Sprowl	Guest
Hernandez	Ronald	Doble Engineering Co.	Guest
Hernandez Cano	Sergio	Hammond Power Solutions	Guest
Hinze	Aaron	American Electric Power	Guest
Hochanh	Thang	Surplec Inc.	Guest
Holdway	Timothy	Retired	Guest
Huang	Chengjun	Power Monitoring & Diagnostic Techn	Guest
Johnson	Charles	Hitachi ABB Power Grids	Guest
Johnson	Jeremy	Intermountain Electronics	Guest
Kittrell	Brad	Consolidated Edison Co. of NY	Guest
Klein	Ken	Grand Power Systems	Guest
Knapek	William	OMICRON electronics Corp USA	Guest
Knapp	Catherine	Cogent Power Inc.	Guest
Lau	Michael	Self Employed	Guest
Lee	Moonhee	Hammond Power Solutions	Guest
Li	Jianming	Sichuan Electric Power Research Insti	Guest
Lively	Parry	Tempel	Guest
Lopes	Ricardo	Efacec Energia, SA	Guest
Lowins	Colby	Federal Pacific Transformer	Guest
Lu	John	Shanghai Huaming Power Equipment	Guest
Martinez	Joaquin	Siemens Energy	Guest
Martinez	Rogelio	Georgia Transformer	Guest
Mattson	Trevor	Schweitzer Engineering Labs	Guest
Mayne	Thomas	Mayne Consultants	Guest
McKinney	Kenneth	UL LLC	Guest
Meton	Therence	METLAB Research Inc.	Guest
Middleton	Robert	RHM International	Guest
Nabi-Bidhendi	Hossein	ABB Inc.	Guest
Naderian	Ali	Metsco	Guest
Nguyen	Nam Tran	ABB Inc.	Guest
Nunn	Shawn	Hitachi ABB Power Grids	Guest
Ohanian	Vahe	UNION Partners LLC	Guest
Ojeda	Sam	LumaSense Technologies	Guest
Owen	John	Powertech Labs Inc.	Guest
Papp	Klaus	Klaus Papp	Guest
Patel	Dhiru	Retired	Guest
Patil	Ankita	Olsun Electrics Corporation	Guest
Pepe	Harry	Phenix Technologies, Inc.	Guest
Plante	Nicolas	Hydro-Quebec IREQ	Guest
Pointner	Klaus	Trench Austria GmbH	Guest
Powell	Chris	Intermountain Electronics	Guest
Rasor	Robert	SDMyers, LLC.	Guest
Raymond	Mark	UL LLC	Guest
Reiss IV	Clemens	Custom Materials, Inc.	Guest
Ricci	Anthony	FirstEnergy Corp.	Guest
Roizman	Oleg	IntellPower Pty Ltd	Guest
Russwurm	Dirk	DTM Instruments, LLC	Guest
Saraf	Manish	Hammond Power Solutions	Guest
Sarkar	Subhas	Retired	Guest
Scarborough	Mark	DuPont	Guest
Schram	Bruce	Acme Electric	Guest
Schwartz	Dan	Quality Switch, Inc.	Guest
Schwarz	Carl	Phoenix Electric Corporation	Guest
Selvaraj	Pugazhenthi	Virginia Transformer Corp.	Guest
Sexton	Aron	Kinectrics	Guest
Sharifi	Masoud	Siemens Gamesa Renewable Energy	Guest
Sharp	Michael	Trench Limited	Guest
Shin	Jane	Consolidated Edison Co. of NY	Guest
Simons	Andre	Cogent Power Inc.	Guest
Som	Sanjib	Pennsylvania Transformer	Guest
Song	Y. C.	JSHP Transformer	Guest
Sonnenberg	Brian	Instrument Transformers, LLC	Guest
Spiewak	Erin	IEEE	Guest
Stacy	Fabian	Hitachi ABB Power Grids	Guest
Stankes	David	3M	Guest
Stretch	Kerwin	Siemens Energy	Guest
Subramany	Shankar	KEMA Labs	Guest
Sun	Yunhan	Shenyang Transformer Research Instit	Guest
Tabakovic	Dragan	Hubbell Power Systems	Guest
Taylor	Marc	Cogent Power Inc.	Guest
Tendulkar	Vijay	Power Distribution, Inc. (PDI)	Guest
Thomas	Thomas	--	Guest
Tozzi	Marco	Camlin Power	Guest
Vaagensmith	Bjorn	Idaho National Laboratory	Guest
Vanier	Jacques	Electro Composites (2008) ULC	Guest
Viereck	Karsten	Maschinenfabrik Reinhausen	Guest
Whipple	Bradley	Idaho National Laboratory	Guest
Whitehead	William	Siemens Energy	Guest
Zaman	Malia	IEEE	Guest

Tom Prevost made a motion at the SC meeting requesting approval "for the Chair of the WG to request a 2 year PAR extension for C57.124". The motion was seconded by Tim-Felix Mai. With no further discussion received regarding this motion, the Chair asked if there was any objection to unanimous approval of the motion. Hearing none, the motion was approved unanimously with no abstentions.

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

The Working Group met virtually on 4/26/21 over Webex. The meeting was called to order at 10:45 AM CDT by Chairman Joseph Tedesco.

Patent call was given. Nobody responded to the patent call. Copyright policy info was shown.

Membership List was shown, and a poll was taken to determine attendance. Poll Results were:
Members- 8, Guests-10, Guests requesting membership- 2.
8/10 members were present, so there was a quorum.

David Walker moved to accept the minutes and agenda as written, Chuck Johnson seconded. 7 of 8 members approved. Agenda and minutes are approved

Old Business:

Joe Tedesco reviewed the changes in the redlined draft that was sent out.

Sections 5.1 and 5.2. Section 5.1 – changed to refer to C57.12.01 definitions of maximum hot spot temperatures rather than defining within this standard. 5.2- included a list of preferred ratings. Other ratings are not prevented on being used. Manish Saraf asked why there was a note about voltages being delta unless otherwise indicated. Joe Tedesco said that it was a holdover from the previous version. David Walker suggested that Note 1 be removed. Chuck Johnson agreed and suggested removing "Voltage Rating" from the section title. Roger Wicks commented that 5.1 needed more detail on "insulation system" maybe "limiting insulation system" to match C57.12.60. David Walker moved that Note 1 of Section 5.2 be deleted. Chuck Johnson seconded. No opposition so Note 1 will be deleted. Chuck Johnson moved that that Section 5.1 "limiting system" be replaced by "limiting insulation system" Colby Lovins seconded. No opposition so motion accepted.

Sections 5.3, 5.4, and 5.5- 5.3, 5.4, and 5.5 modified to say that they were to be in accordance with C57.12.01 rather than a detailed specification in this standard for taps, insulation level, and angular displacement. No discussion about these changes. In the absence of opposition to the changes they will be retained and become part of the next draft version.

Sections 5.6 and 6.1- Section 5.6 on impedance voltages now refers to C57.12.01 rather than have details in C57.12.52. Manish Saraf suggested that having standard impedances might be useful. Joe Tedesco reminded the group that this discussion happened in the C27.12.01 meeting and it was decided there to remove standard impedances. Chuck Johnson said that impedance is always a customer prerogative. Shawn Nunn said that C57.12.51 had had the same discussion and removed the table. Chuck Johnson and Casey Ballard both were OK as is. David Walker suggested that sections that only refer to C57.12.01 be removed. Casey Ballard felt that removing statements that just referred to C57.12.01 was OK. Chuck Johnson felt that duplicated information in standards created potential conflict as version changed. Casey Ballard agreed. David Walker moved that we accept the redlined version as written. Chuck Johnson seconded. Alex Macias said that they have a standard table for their customers. Roger Wicks asked how may units are new versus replacement? Alex Macias asked about impedance tolerances. David Walker pointed out that C57.12.01 contains the tolerances. Manish Saraf suggested that the title match C57.12.01 as "Impedance". David Walker amended the motion to include changing the title. Alex Macias said the C57.12.01 used the term "impedance rating". David Walker amended the amended motion to change the title of 5.6 to "Impedance" and the text to "The Impedance rating" shall be in accordance to C57.12.01.

Section 6.1- Dave Stankes asked about the term "limiting temperature". Chuck Johnson said that was the terminology used in C57.12.01. David Walker asked how this is different than in C57.12.01. It is the same as C57.12.01 according to Chuck Johnson. Chuck Johnson suggested that there should be a reference to C57.12.01 but perhaps refer to a specific part of C57.12.01. Casey Ballard suggest that a reader needs to be familiar to C57.12.01. David Walker said that 5.1 has all the information in 6.1 and 6.1 may not be necessary. Chuck John suggested that 6.1 be left as is and just refer to C57.12.01. Chuck Johnson moved that we change 6.1 read "The insulation system of the transformer shall be suitable for operation at the specified limiting temperature in accordance with C57.12.01". Colby Lovins seconded. Manish Safar asked if the word

"winding" should be included. After discussion, it was determined that "winding" wasn't needed. Motion passed unanimously.

Alex Macias asked if there were interim meetings planned. Joe Tedesco said that none were currently planned. David Walker suggested an interim before the next bi-annual meeting would be useful to help meet the desire to has a revision balloted before the expiration of the current version. Joe Tedesco will investigate how to hold an interim meeting.

Chuck Johnson and others mentioned that they did not get the redlined draft in email. Joe Tedesco will investigate it.

Joe Tedesco adjourned the meeting at 12:06 pm CDT.

The Working Group will meet again in Fall 2021, unless there is an interim meeting before that.

Chairman: Joseph Tedesco
Secretary: David Walker

Attendance List

Subgroup Name	Role	First Name	Last Name	Company	10/19/2020	4/26/2021
C57.12.52	Guest	Dieter	Wagner	Hydro One		X
C57.12.52	Member	Charles	Johnson	Hitachi ABB Power Grids	X	X
C57.12.52	Guest	Roger	Wicks	DuPont		X
C57.12.52	Guest	Derek	Foster	Magnetics Design, LLC		X
C57.12.52	Member	David	Stankes	3M	X	X
C57.12.52	Guest	Clemens	Reiss IV	Custom Materials, Inc.		X
C57.12.52	Member	Robert	Ballard	DuPont	X	X
C57.12.52	Member	Shawn	Nunn	Hitachi ABB Power Grids	X	
C57.12.52	Guest	Alejandro	Macias	CenterPoint Energy		X
C57.12.52	Guest	Aniruddha	Narawane	Power Distribution, Inc. (PDI)		X
C57.12.52	Guest	Kenneth	Harden	Schneider Electric	X	
C57.12.52	Secretary	David	Walker	MGM Transformer Company	X	X
C57.12.52	Member	Tim-Felix	Mai	Siemens Energy	X	X
C57.12.52	Member	Juan Pablo	Andrade Medina	Olsun Electrics Corporation	X	X
C57.12.52	Guest	Ken	Klein	Grand Power Systems		X
C57.12.52	Chair	Joseph	Tedesco	Hitachi ABB Power Grids	X	X
C57.12.52	Member	Sergio	Hernandez Cano	Hammond Power Solutions	X	
C57.12.52	Member	Colby	Lovins	Federal Pacific Transformer	X	X
C57.12.52	Guest	Justin	Shrewsbury	AMR PEMCO		X
C57.12.52	Guest	Manish	Saraf	Hammond Power Solutions		X
C57.12.52	Member	Chris	Powell	Intermountain Electronics	X	X
C57.12.52	Guest	Jeremy	Johnson	Intermountain Electronics	X	X
C57.12.52	Guest	Kyle	Knous	EATON Corporation	X	
C57.12.52	Guest	Adam	Smith	Commonwealth Associates, Inc.	X	
C57.12.52	Guest	Hossein	Nabi-Bidhendi	ABB Inc.		X
C57.12.52	Guest	Giovanni	Hernandez	Virginia Transformers Corporation		X

Note: Names and company affiliations are those listed in AMS as of April 27, 2021.

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

Chair: David Stankes
Secretary: Joseph Tedesco

This was the first meeting of the IEEE 259 Working Group; the PAR having been approved by RevCom on December 3, 2020 meant that the work of the preceding task force was finished. The meeting was held virtually via Webex and David Stankes called the meeting to order at 3:45 PM.

The patent slides were shown, and the copyright policy was discussed. There were no essential patent claims.

There were 30 people present in the meeting. Of those that voted in the poll, 6 people identified as members, 11 people identified as guests requesting membership, and there were 10 guests. Three did not answer and were recorded as guests. Because this was the first meeting, there was no quorum, and everyone requesting membership would become a member.

A motion to approve the agenda was made by Casey Ballard and seconded by Tim-Felix Mai. There was unanimous approval of the motion. Dave asked if there were any concerns about the minutes from the Fall 2020 Task Force meeting; there were five members of the Task Force present, but none had complaints. The minutes were approved unanimously.

Old Business:

- Because this was the first Working Group meeting, there was no old business.

New Business:

- A brief overview of the background of the standard was provided.
    - It hadn't been revised in over 30 years, and it was decided that it would just be withdrawn due to lack of use before it was realized that it was referenced in C57.12.60.
    - The decision was made to revive the standard and to make a serious effort to do a good job revising it and bringing it up to date.
- The title, scope, and purpose from the PAR and highlighted some of the key points of the existing version of the standard.
- There was a short discussion regarding sample type because both full size coils and representative model coils would be allowed, and the names from C57.12.60 would be used. If the test samples used as full-size transformer coils, then extreme care must be taken to ensure that 259 does not end up identified as a transformer standard but remains an EIS standard. The group was then reminded that whoever works on the sections regarding test samples and methods must include verbiage to reinforce that this is an EIS standard.
- A comparison was shown between the Table of Contents of the current version of 259 and a "standard" EIS test method. He stated that there's a lot of good material in the standard, especially considering this is a 30-year old standard. The overall testing and its purpose were described.
- There was mention that the requirements of IEEE 259 are different from other aging standards. The stresses in 259 are higher than in UL 1446, so it's possible that an insulation system qualified under UL 1446 might not pass the tests in 259. Furthermore, an insulation system in 259 is meant to be compared to a reference system, while an insulation system aged C57.12.60 does not necessarily have to have a reference. IEEE 259 is for comparison to a known system.
- There was then a discussion about the reference systems. The question was asked that if no one has used 259 for years, what if a company doesn't have a reference insulation system? The question was asked whether the standard would dictate a reference insulation system, or whether it would be unique to each company? The response was that the job of the working group is to share best practices with the industry and offer suggestions, not to dictate. The key would be to make the guidance useful without opening the standard to abuse. The working group should provide guidance on samples and determining a reference insulation system.
- The group was also reminded that we would need to ensure that there are minimum life requirements for the reference insulation system.
- An outline of the improvements that would be needed to 259 was outlined:
    - appropriate terminology
    - definitions
    - the relationship to UL 1446

  - the screening test (similar to the screening test in C57.12.60)
  - flow chart for the test order
  - updated recommended temperature tables
- The current draft of 259 was shown, which led to questions regarding which transformers would 259 apply and whether the definition of applications in the scope needed to be so specific? The suggestion was made that the definition be expanded to go beyond transformers. The group was reminded that 259 was meant to be an insulation system standard, which prompted the statement that, while that was true, the two were certainly related, because the insulation system would be used in a particular type of equipment, so the insulation system would need to be suitable for that equipment.
- The development plan was announced. The work would be split up into a series of task forces covering the major sections and appendices. Volunteers were solicited to develop different sections of the standard as individual task forces. Several attendees volunteered to work on the various sections.
- There was an inquiry regarding whether the meetings would be held at a different time, because this time conflicted with other working groups, and that is possible.
- A question was asked if a draft would be circulated, and it would be.
- There was a request for anyone who was interested in being Secretary to contact the Chair.

The date of the next meeting will be no later than the Fall 2021 meeting on either October 18 or October 19, 2021. It is possible that there could a meeting prior to the Fall meeting, but that decision was not final. The Fall meeting will either be in Milwaukee, Wisconsin or will be held virtually.

The meeting was adjourned at 5:01 PM CDT.

Attendance List

Role	**First Name**	**Last Name**	**Company**
Member	Robert	Ballard	DuPont
Guest	Olle	Benzler	Megger
Member	Piotr	Blaszczyk	Specialty Transformer Components LLC
Member	Solomon	Chiang	The Gund Company
Guest	Feras	Fattal	Manitoba Hydro
Member	Derek	Foster	Magnetics Design, LLC
Guest	Rob	Ghosh	GE
Guest	Sergio	Hernandez Cano	Hammond Power Solutions
Member	John	Herron	Raytech USA
Member	Charles	Johnson	Hitachi ABB Power Grids
Guest	Ken	Klein	Grand Power Systems
Member	Moonhee	Lee	Hammond Power Solutions
Member	Aleksandr	Levin	Weidmann Electrical Technology
Member	Colby	Lovins	Federal Pacific Transformer
Member	Tim-Felix	Mai	Siemens Energy
Guest	Joaquin	Martinez	Siemens Energy
Member	Aniruddha	Narawane	Power Distribution, Inc. (PDI)

Guest	Chris	Powell	Intermountain Electronics
Member	Manish	Saraf	Hammond Power Solutions
Guest	Markus	Soeller	Power Diagnostix
Guest	Brian	Sonnenberg	Instrument Transformers, LLC
Chair	David	Stankes	3M
Guest	Radoslaw	Szewczyk	Specialty Products Poland Sp. z o.o.
Secretary	Joseph	Tedesco	Hitachi ABB Power Grids
Guest	Dervis	Tekin	Meramec Instrument Transformer Co.
Member	Vijay	Tendulkar	Eaton
Member	Edward	Van Vooren	ELTEK International Laboratories
Guest	Peter	Werelius	Megger
Member	Roger	Wicks	DuPont
Guest	Malia	Zaman	IEEE

D.3.7 IEEE C57.134 Chair Colby Lovins

The working group met via webex on 4/26/21.

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

Chair made opening comments.

The meeting was convened with 24 participants, 4 requesting membership , 14 members and 5 guests. 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

- PAR being reviewed, still a task force but seems like good to go to be a WG on the next meeting.
- Reviewing changes on title and scope discussed on the last meeting with no additional comments.
- Text removed from existing purpose was discussed. Chair questioned if it made sense to move that text to the excerpt on the introduction, since it seems like with different words, the same idea is already written there. The group agreed to add the deleted text into the introduction.
- Same text being proposed to be added to section 1.3. A. Levin motions to add the entire excerpt text to section 1.3. J Tedesco second. Motion was approved. Amendment to change the title of section 1.3 as well. Many friendly amendments later the group agreed to a new title for section 1.3.

New Business

- Discussion regarding section 4.
    - Motion by C. Johnson to remove resistance bridges from the list. Vijae second. Motion is approved. Vijay motion to remove Temp labels and infrared temp detectors as well. C. Johnson seconds. Motion is approved.
    - Discussion about splitting sensor category into two sections, Internal and Surface Sensors.
    - Recommendations to check Annex D on C57.12.60 to see text applies to this std as well as C57.165.

Attendees:

Last Name	Frist Name	Company	Role
Andrade Medina	Juan Pablo	Olsun Electrics Corporation	Secretary
Ballard	Robert	DuPont	Member
Rezael-Zare	Afshin	York University	Guest
Foster	Derek	Magnetics Design, LLC	Guest
Stretch	Kerwin	Siemens	Guest
Saraf	Manish		Guest
Johnson	Charles	Hitachi ABB Power Grids	Member
Payne-Powell	Paulette	Retired	Guest
Klein	Ken	Grand Power Systems	Member
Lee	Moonhee	Hammond Power Solutions	Member
S. Levin	Aleksandr	Weidmann Electrical Technology	Member
Marek	Richard	Retired	Guest
Lovins	Colby	Federal Pacific Transformer	Chair
McTaggart	Ross	Trench Limited	Guest
Martinez	Joaquin	Siemens Energy	Guest
Chiang	Solomon	The Gund Company	Guest
Nunn	Shawn	Hitachi ABB Power Grids	Member
Powell	Chris	Intermountain Electronics	Member
Mai	Tim-Felix	Siemens Energy	Member
Stankes	David	3M	Member
Tedesco	Joseph	Hitachi ABB Power Grids	Member
Tendulkar	Vijay	Power Distribution, Inc. (PDI)	Member
Wicks	Roger	DuPont	Member
Vinay	Patel	Consolidated Edison Co. of NY	Guest

With no further business, the meeting was adjourned at 3:35 PM. WG will plan to meet again at Fall Transformer Committee meeting.

Chair: Colby Lovins
Secretary: Juan Pablo Medina

D.3.8 IEEE C57.96 Chair Aniruddha Narawane (Presented at SC by Kerwin Stretch)

- Meeting called to order on Tuesday April 27 at 12:55pm 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.
- The chair presented the information on the IEEE Copyright – No question, comments, or concerns were raised.
- The PAR for C57.96 was approved, and the TF is now transitioned to a Working Group.
- A poll to establish a quorum was taken based on previous participation. 15 task force members were present out of 26 previous attendees thus a quorum was achieved.
- The chair shared the agenda with the membership and Casey made a motion to accept the WG agenda as shown. The motion was seconded by Vijay and passed unanimously without discussion.
- A poll was conducted to establish membership in the new Working Group. As this is the first meeting for the WG any guest requesting membership is automatically approved. Results as follows –
    - 15 members (carried over from TF)
    - 5 guests
    - 12 guests requesting membership
- As this was the first meeting of the TF, a quorum was established based on this poll.

- The chair presented a breakdown of the five sections to be reviewed in Draft D1 and asked for volunteers review and evaluate each section. Great support from the membership and several volunteers came forward. Results were as follows –

TF or Subgroups for review of Draft D1

	Clause to Review	Sections	Volunteer
1	Normative Reference, Definitions and Overview	2, 3, 4	Joe Tedesco, Tim-Felix Mai, Colby Lovins, Dave Stankes, Aleksandr Levin
2	Loading Equations	5	David Walker, Ryan Hoog, Manish Saraf, Justin Shrewsberry
3	Loading Based on Life Expectancy	6	Roger Wicks, Chuck Johnson
4	Annex B (Update programming to latest platform)	Annex B	Chuck Johnson
5	Annex C (Example Calculations)	Annex C	Hemchandra Shertukde

- The chair will redistribute the Draft D1 to all members and guests after the meeting.
- Draft D1 of C57.96 was shown on screen at 1:15pm and discussion was started.
    - Section 1, Scope and Purpose based on the PAR was reviewed with no comments.
    - Section 2, Normative References was presented
        - Comment from chair was that no changes were known but this assumption must be checked.
        - A suggestion was made to review if C57.12.56 should move to the bibliography.
        - Casey proposed that Section 2 could be reviewed in further detail after the Draft was further along in the review process.
    - Section 3, Definitions was shown on the screen
        - Tim-Felix commented that definitions are fully covered by C57.12.80 and thus the text of this section could be replaced with a reference to 12.80
        - Casey mentioned that in the newest templates for standards this section is covered by a boilerplate that refers back to C57.12.80
        - Chair will check with IEEE (Malia) and request that the draft be upgraded to the new template.
    - Section 4, Overview was shown
        - Vijay commented that the dates on all standards referred to should be checked. David Walker suggested that standards should be referenced in the simplest and most generic way.
        - Lengthy discussion regarding the inclusion of C57.12.56. Main topics were-
            - Casey – Generally a bad practice to address withdrawn standards such as 12.56
            - Chuck – Some users may need to be able link back to these withdrawn standards to evaluate previous qualifications.
            - Some discussion about if C57.12.56 was still available for purchase. This was checked by Joe Tedsco during the discussion and was found to still be available in IEEE Xplore

        - Ryan Hoog proposed that the volunteers working on this section of the review will have a deeper look and make some proposals.
        - Dave Stankes pointed out that both Section 1 and Section are titled "Overview". This could cause some confusion but appears to be in the standard template so no action needed.
    - Additional discussions on text related to Loading above Rated
        - Ryan Hoog – this topic is being heavily discussed in the DOE / Efficiency group specifically related to dual nameplates.
        - Roger Wicks – suggested to check in with the WG for the Liquid Immersed Loading guide an align where possible.
        - Joe Tedesco – Standard is more directed toward end users than manufacturers. Manufacturers must ensure that the whole system including components must be suitable for any intended overloading. Comment supported by Ryan Hoog who also mentioned that the standard is helpful for altitude correction and de-rating.
        - Several representatives of transformer manufacturers also mentioned that they rely on this document for costumer discussion and as a guide for designing transformers with special overload conditions requested by some customers.
        - Chuck Johnson mentioned that the intended focus and purpose of the loading guide is the insulation system and more specifically the windings. All other accessories (tap changers, leads, etc.) should be excluded.
- Discussions of Draft D1 were stopped at 2:05pm.
- Chair asked the review volunteers connect with each other between now and the next meeting to ensure progress on the review. Additionally, the chair plans for an interim meeting of the WG with time and date to be determined.
- Vijay made a motion at 2:20pm to adjourn the meeting. Motion was seconded by Chuck and passed unanimously.

First Name	Last Name	Role	Company
Juan Pablo	Andrade Medina	Member	Olsun Electrics Corporation
Robert	Ballard	Member	DuPont
Solomon	Chiang	Guest	The Gund Company
Derek	Foster	Guest	Magnetics Design, LLC
Giovanni	Hernandez	Guest	Virginia Transformers Corporation
Ryan	Hogg	Guest	Bureau of Reclamation
Mohammad	Iman	Vice-Chair	MGM Transformer Company
John	John	Guest	Virginia Transformer Corp.
Charles	Johnson	Member	Hitachi ABB Power Grids
Ken	Klein	Member	Grand Power Systems
Moonhee	Lee	Member	Hammond Power Solutions
Aleksandr	Levin	Guest	Weidmann Electrical Technology
Colby	Lovins	Member	Federal Pacific Transformer
Tim-Felix	Mai	Member	Siemens Energy
Richard	Marek	Member	Retired
Aniruddha	Narawane	Chair	Power Distribution, Inc. (PDI)
Shawn	Nunn	Member	Hitachi ABB Power Grids
Vinay	Patel	Guest	Consolidated Edison Co. of NY
Caroline	Peterson	Guest	Xcel Energy
Chris	Powell	Member	Intermountain Electronics
Afshin	Rezaei-Zare	Guest	York University
Manish	Saraf	Guest	Hammond Power Solutions
Stefan	Schindler	Guest	Maschinenfabrik Reinhausen
Hemchandra	Shertukde	Guest	University of Hartford
Justin	Shrewsbury	Guest	AMR PEMCO
Adam	Smith	Guest	Commonwealth Associates, Inc.
Brian	Sonnenberg	Guest	Instrument Transformers, LLC
David	Stankes	Guest	3M
Kerwin	Stretch	Secretary	Siemens Energy
Radoslaw	Szewczyk	Guest	Specialty Products Poland Sp. z o.o.
Joseph	Tedesco	Member	Hitachi ABB Power Grids
Dervis	Tekin	Guest	Meramec Instrument Transformer Co.
Vijay	Tendulkar	Member	Power Distribution, Inc. (PDI)
John	Vartanian	Guest	National Grid
David	Walker	Guest	MGM Transformer Company
Roger	Wicks	Member	DuPont

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

D.3.9 IEEE C57.12.80 WG Terminology Chair Tim-Felix Mai

Tim-Felix Mai provided update to the Dry Type subcommittee and asked our SC to refer to the C57.12.80 minutes posted as part of the Standards SC. He noted that he did review definitions related to Dry Type in the

12.80 document and recommended some definition changes related to Cooling Classes at the WG meeting which were accepted.

Chair and Tim-Felix Mai recommended that WG Chairs review their documents and use reference to C57.12.80 where possible to eliminate duplicate definitions.

D.3 Old Business

D.4.1 Status of Standards

Chair identified two standards that are coming up for revision soon (Revision due dates in 2025).

- IEEE C57.12.59 Guide for Dry-Type Transformer Through-Fault Current Duration
- IEEE C57.94 Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type Distribution and Power Transformers

Chair asked for volunteers for Chair and Secretary for C57.12.59. Paulette Payne-Powell who lead previous revision effort offered her assistance, but may be limited in the amount of help she may be able to offer for this revision.

Dave Stankes and Juan Medina offered to lead TF for C57.94 as Chair and Vice Chair respectively. Tim-Felix Mai offered to serve as Secretary.

D4.2 NEMA Low Voltage (LV) Standards

Chair informed the SC that the NEMA update would be provided in writing to the SC. Update is as follows:

NEMA has decided that they are not interested in transferring the copyright of their LV dry-type transformer standards, including ST20, to IEEE. They have changed their process from the previous documents they transferred now called IEEE C57.12.50, IEEE 57.12.51, IEEE C57.12.52, and ANSI C57.12.55 and others. Instead NEMA is interested in opening up participation into their standards development beyond OEMs which are paying members. Jonathan Steward from NEMA made a presentation to the Administrative Committee prior to the Spring 21 meetings and delivered that message. No details were provided on the procedures for revision of existing documents nor the creation of new standards would be organized between NEMA and IEEE. As more details are available the Chair will share them with the Dry-Type Subcommittee.

D.4 New Business

Chair will be sending out poll to the Subcommittee members prior to our fall meeting asking for comments related to suggested topics to be covered in the next revisions of C57.12.01 and C57.12.91. Chair will also provide some background regarding these standards related to the poll request.

A question was made by a Joe Tedesco on whether C57.12.55 should be opened again, as this was brought up in previous SC meeting. The Chair agreed to add this question to the same poll that will be circulated regarding the 12.01 and 12.91 topics.

With no further business, the meeting was adjourned at 2:12 PM.

Chairman: Casey Ballard

Vice Chairman: Open

Secretary: David Stankes

Attendees of April 29, 2021 Dry-type Transformer Subcommittee Meeting

Role	First Name	Last Name	Company
Guest	Mubarak	Abbas	Siemens Industry
Member	Juan Pablo	Andrade Medina	Olsun Electrics Corporation
Chair	Robert	Ballard	DuPont
Guest	William	Boettger	Boettger Transformer Consulting LLC
Guest	David	Caverly	Trench Limited
Member	Solomon	Chiang	The Gund Company
Member	J. Arturo	Del Rio	Siemens Energy
Member	Derek	Foster	Magnetics Design, LLC
Guest	Alexander	Gaun	Coil Innovation GMBH
Guest	Rob	Ghosh	General Electric
Guest	Detlev	Gross	Power Diagnostix
Guest	Michael	Haas	Instrument Transformers, LLC
Guest	Giovanni	Hernandez	Virginia Transformers Corporation
Guest	Sergio	Hernandez Cano	Hammond Power Solutions
Guest	Mihai	Huzmezan	Power Diagnostix
Member	Mohammad	Iman	MGM Transformer Company
Guest	Ramadan	Issack	American Electric Power
Member	John	John	Virginia Transformer Corp.
Member	Charles	Johnson	Hitachi ABB Power Grids
Member	Ken	Klein	Grand Power Systems
Member	Moonhee	Lee	Hammond Power Solutions
Member	Aleksandr	Levin	Weidmann Electrical Technology
Member	Colby	Lovins	Federal Pacific Transformer
Guest	Alejandro	Macias	CenterPoint Energy
Member	Tim-Felix	Mai	Siemens Energy
Member	Richard	Marek	Retired
Member	Rhea	Montpool	Schneider Electric
Guest	Hossein	Nabi-Bidhendi	ABB Inc.
Guest	Shawn	Nunn	Hitachi ABB Power Grids
Member	Paulette	Payne-Powell	Retired
Guest	Caroline	Peterson	Xcel Energy
Member	Klaus	Pointner	Trench Austria GmbH
Guest	Chris	Powell	Intermountain Electronics
Member	Thomas	Prevost	Weidmann Electrical Technology
Guest	Ulf	Radbrandt	Hitachi ABB Power Grids

Guest	Afshin	Rezaei-Zare	York University
Guest	Manish	Saraf	Hammond Power Solutions
Guest	Hamid	Sharifnia	Consultant
Member	Michael	Sharp	Trench Limited
Guest	Hemchandra	Shertukde	University of Hartford
Guest	Avijit	Shingari	Pepco Holdings Inc.
Member	Justin	Shrewsbury	AMR PEMCO
Guest	Adam	Smith	Commonwealth Associates, Inc.
Guest	Markus	Soeller	Power Diagnostix
Guest	Brian	Sonnenberg	Instrument Transformers, LLC
Secretary	David	Stankes	3M
Guest	Kerwin	Stretch	Siemens Energy
Member	Joseph	Tedesco	Hitachi ABB Power Grids
Guest	Dervis	Tekin	Meramec Instrument Transformer Co.
Member	Vijay	Tendulkar	Power Distribution, Inc. (PDI)
Guest	Parag	Upadhyay	ABB Inc.
Member	David	Walker	MGM Transformer Company
Member	Roger	Wicks	DuPont
Guest	Malia	Zaman	IEEE