Annex J Performance Characteristics Subcommittee (PCS)

October 22nd, 2025, Hyatt Regency, Bonita Springs, FL

UNAPPROVED MINUTES

Chair: Sanjib Som
Vice Chair: Kris Zibert
Secretary: John Wagner

J.1 Introduction / Attendance

Quorum was achieved with 82 members present. In addition, 105 guests were present at the meeting. The total attendance at the meeting was 187. Guests should contact the Vice Chair to request membership. Their requests for membership and past attendance will be reviewed. If they meet the membership requirements, they will be granted membership before the next meeting in Fort Worth, TX March 22-26 2026.

J.2 Chairman's Remarks

The Chair gave the Chairman's Remarks.

The Chair introduced himself, the Vice Chair and secretary and provided the below updates and comments.

The Chair discussed that the meeting would be recorded for minutes purposes and then deleted.

The Chair asked anyone with new business to submit said business in writing prior to the meeting.

The Chair gave a reminder regarding affiliation data as a requirement and to continue updating attendance manually.

PCS Responsibilities: Defined by the Transformers Committee Organization and Procedures Manual.

The Performance Characteristics Subcommittee shall be responsible for the following:

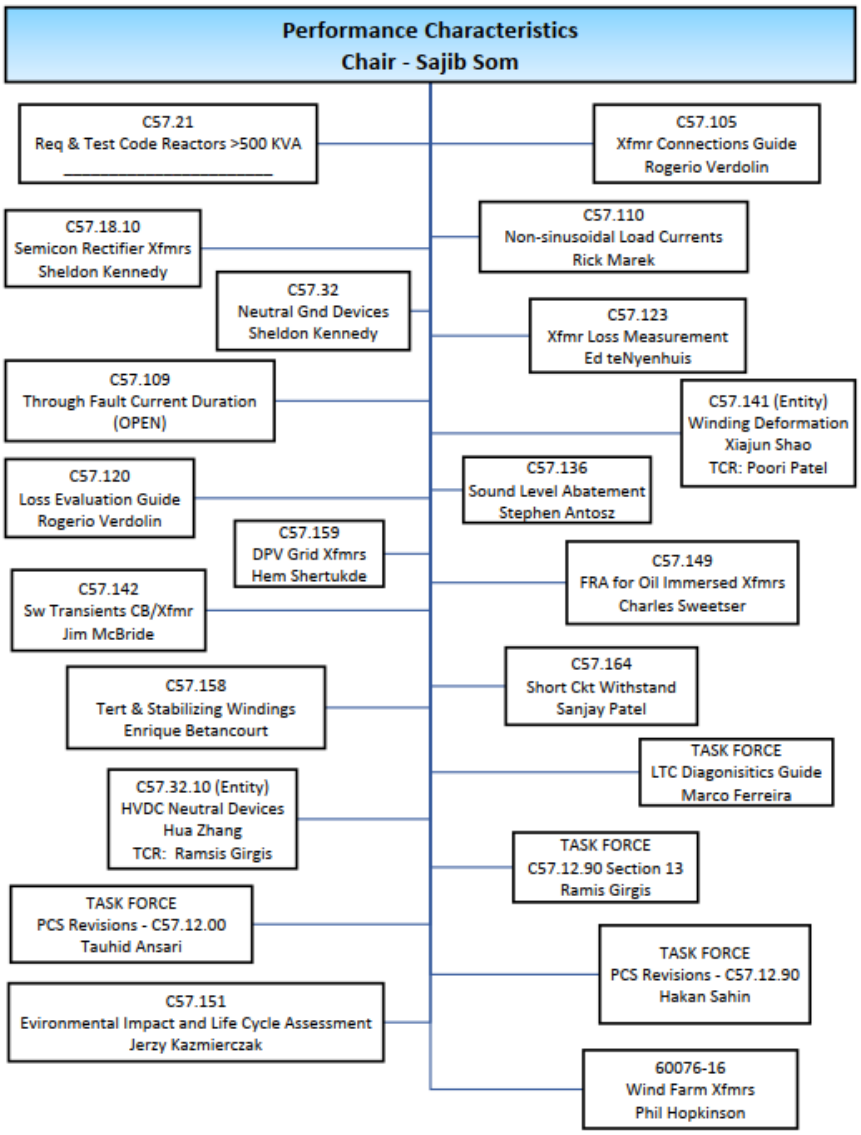
- Studying and reviewing the treatment of loss, impedance, exciting current, inrush current audible sound and vibration, and other performance characteristics and their methods of application, measurement, or test for liquid filled transformers and liquid filled and dry type reactors.

- Studying and reviewing the treatment of the performance characteristics of other special use transformers e.g. photovoltaic, wind, and rectifier transformers.

- Developing and maintaining related standards, recommended practices, and guides for such criteria

- Coordinating with other technical committees, groups, societies, and associations as required

Standards Supported by PCS:



- C57.12.00 – TF to provide PCS revisions – T. Ansari
- C57.12.90 – TF to provide PCS revisions – H. Sahin (test code) & R. Girgis (audible sound)
- C57.18.10 – Semiconductor rectifier transformers – S. Kennedy

- C57.21 – Requirements & Test Code For Shunt Reactors >500kVA – S. Som
- C57.32-2015 – Neutral Grounding Devices (2025) – S. Kennedy
- C57.32.10 – Entity WG Neutral Grounding Reactors Guide for HVDC Converter Transformers – H. Zhang (TCR: R. Girgis)
- C57.105 – Transformer connections guide – R. Verdolin
- C57.109 – Through Fault Current Duration – OPEN
- C57.110 – Xfrmr Capability when Supplying Nonsinusoidal Load Currents – R. Marek
- C57.120 – Guide for loss evaluation – R. Verdolin
- C57.123 – Transformer Loss Measurement – E. teNyenhuis
- C57.136 – Sound Abatement Guide – S. Antosz
- C57.141 - Entity - Winding Deformation – X. Shao (TCR: P. Patel)
- C57.142 – Switching Transients Circuit breaker/Transformer – J. McBride
- C57.149 – FRA for Oil Immersed Transformers – C. Sweetser
- C57.158 – Tertiary & Stabilizing Windings (2027) – E. Betancourt
- C57.159 – DPV Transformers (2026) – H. Shertukde
- C57.164 – Short Circuit Withstand – S. Patel
- TF for Insulating Fluid for Factory Testing – E. teNyenhuis
- TF for LTC Diagnostics Guide – M. Ferreira
- 60076-16 – Wind Turbine Generator Transformers – P. Hopkinson
- C57.151 Eval Guide Environmental Impact of Transformers & Reactors – J. Kazmierczak

Status of Active PAR's:

- **2025 PAR's**
  - **C57.142 Transient Guide (Comment Resolution)**
  - **C57.141 Entity WG Guide for Detection, Monitoring and Evaluation of Winding Deformation**
- **2027 PAR's**
  - **C57.32 Neutral Grounding Devices**
  - **C57.158 Application of Tertiary and Stabilizing Wdgs Guide**
- **2028 PAR's**
  - **C57.159 DPV Transformers Guide**
  - **C57.151 Enviro & Life Cycle Assessment**
- **2029 PAR's**
  - **C57.120 – Loss Evaluation Guide (New WG)**

Status of Standards without active PARs

- **60076-16-2018 – Wind Turbine Generator Transformers (2028)**
- **C57.109-2018 – Through Fault Current Duration (2028)**
- **C57.110-2018 – Transf. Capability when Supplying Nonsinusoidal Loads (2028)**
- **C57.105-2019 – Transformer connections guide (2029)**
- **C57.123-2019 – Loss Measurement Guide (2029)**
- **C57.164-2021 – Short Circuit Withstand Guide (2031)**
- **C57.21-2021 – Shunt Reactors over 500kVA (2031)**
- **C57.18.10-2021 – Semiconductor Rectifier Transformers (2031)**
- **C57.136-2023 – Sound Level Abatement Guide (2033)**
- **C57.149 – FRA Guide (2034)**

Performance Characteristics Subcommittee Membership Requirements

- Voting membership may be requested and granted after attending three of the last five meetings.
- If a voting member misses more than two consecutive meetings, his or her voting privileges may be revoked. Notification will be sent if voting privileges are revoked.
- Refer to TC P&P 4.3.1 for more information.

Performance Characteristics Subcommittee WG / TF Leaders

- Issue agenda at least 30 days ahead of time
- Minutes are due in 15 days; please get a rough draft of them to us today in MS Word (not PDF) format
- Please keep your webpages up to date – review regularly and send any content/files to tc-webmaster@ieee.org.
- A patent and copyright call must occur at every WG/TF meeting
- Please send to Patrycja Jarosz (p.jarosz@ieee.org) your WG roster by November 7th, 2025, including last name, first name, email address, and voting status.

Performance Characteristics Subcommittee Meeting Minutes

- Name of the group, time, date, and location of meeting
- Officers' names, meeting participants, member status, and affiliations
- Chair's remarks and reminders of IEEE policies (Patent and Copyright)
- Approval of minutes of previous meeting and agenda
- Technical topics: Brief summary (discussions and conclusions, motions exactly as they are stated, including the names of proposer and seconder, and the outcome of each motion)
- Action items, items reported out of executive session

- Recesses and time of final adjournment
- Next meeting—date, time, and location

WG / TF Balloting Reminder
- Working Groups must achieve a 2/3 majority to submit a document for Sponsor Ballot.
- The Subcommittee must achieve a simple majority to submit a document for Sponsor Ballot.

Attendance / Membership – moved to Guest status
The following member missed more than 2 consecutive meetings and have been moved to "Guest" status:

Alex Alahmed John Herron

Mike Spurlock

Please contact Kris (kris.zibert@amce.com) by sending him a message or see him after the meeting if you believe your membership status is not accurate and/or you would like to become a member.

Attendance / Membership – New Members
The following Guests requested membership at the Spring 2025 meeting and have attended 3 of the past 5 meetings:

Mihir Amin	Elise Arnold
Fernando Leal	Xose Lopez-Fernandez
Alberto Martinez	Marta Munoz
Marc Taylor	Joe White
Fei Yang	

Attendance / Membership – Quorum determination

- Current breakdown of the Subcommittee:
  - 119 Members
  - 60 are needed for a quorum
- Quorum was established with 82 members in attendance.

J.3 Approval of Agenda

The Chair presented the agenda and entertained a motion to approve. The agenda had been sent to the members by email several weeks prior to the meeting. The motion was made by W. Binder and seconded by D. Sauer. The motion passed by unanimous consent.

J.4 Approval of Last Meeting Minutes

The Chair presented the minutes of meeting held in March 2025 and entertained a motion to approve. The minutes had been sent to the members by email several weeks prior to the meeting. The motion was made by D. Welton and seconded by D. Sauer. The motion passed by unanimous consent.

J.5 Minutes from Working Groups and Task Force

The following WG and Task Force reports were received (the reports are appended later).

- **WG Eval Guide Environ Impact of Trans & Reactors PC57.151 J. Kazmierczak**
- **TF Audible Sound Rev to Test Code R. Girgis**
- **TF Transformer Data Required for System Studies J. Watson**
- **TF Continuous Revisions to C57.12.00 T.Ansari**
- **WG Standard for DPVTs C57.159 H. Shertukde**
- **TF Continuous Revisions to Test Code C57.12.90 H. Sahin**
- **WG Sw Transients Ind by Xfmr/Bkr Interaction PC57.142 J. McBride**
- **WG C57.158 App. Guide for Tertiary and Stabilizing Windings E. Betancourt**
- **WG IEEE Neutral Grounding Devices PC57.32 S. Kennedy**
- **WG PC57.141 Entity Winding Deformation Guide X. Shao (P. Patel)**
- **PC57.120, IEEE Guide for Loss Evaluation of Dist. and P. Transf. and React. R. Verdolin**
- **TF – Xfmrs for wind turbine application IEC/IEEE 60076-16 S. Debass**
- **TF C57.109 Through Fault Current Duration S. Hoffman**
- **TF C57.110 Xfmr Capability when supplying non-sinusoidal Load Currents S. Narawane**

Below are highlights that were discussed at the PCS meeting:

1. **WG Eval Guide Environ Impact of Trans & Reactors PC57.151 J. Kazmierczak**

   J. Kazmierczak presented.

   - This is the third meeting of the WG after receiving PAR.
   - A call to order was made at 11:00 AM

- The patent & copyright policy was reviewed. A call for any patents was made. No Patents were announced.
- Quorum was taken but not achieved
- There were 58 total attendees, with only 25 members. 37 Members were needed for quorum. The Agenda & approval of MoM's from Denver could not be made due to lack of quorum.
- The status of the CIGRE guide was presented by Myles Margot. His presentation will be available on the TC website for the group. The guide should have a draft by early 2026. It was suggested to look at the structure of the work packages that CIGRE has established.
- Poorvi Patel Hitachi Energy, commented that the document for section 3 should be distributed for comments. It will be distributed after this meeting.
- A chart overview of who is leading what with deadlines was requested.
- A call for any new business was made. No new business was brought up.
- The meeting was adjourned at 10:48

2. TF Audible Sound Code Revision **R. Girgis**

M. Bernesjo presented on behalf of chair R. Girgis.

- The TF met at 1:45 PM, on Monday, October 20, 2025
- The meeting was attended by 76, including 46 members
- A quorum was established
- 7 attendees requested membership
- First, the secretary presented:
- A summary of previous work performed in this area from the last two meetings
- Originally proposed Addition to the Noise Guide, C57.136
- Summary of results from the questionnaire sent to manufacturers of Power Transformers

- Revised proposed Addition to the Noise Guide, C57.136 after implementing results of the questionnaire

- A motion to survey the revised proposed Addition to the Noise Guide at the TF was approved.

R. Girgis announced he resigns from chair of the TF and recommends S. Antozs as new chairman. S. Som profusely thanked R. Girgis for his fantastic service. Taking in consideration from R. Gergis, S. Som sought confirmation from S. Antozs of his willingness to take the position. S. Antozs provided his consent and S. Som appointed him as the new chair.

3. TF Transformer Data Required for System Studies J. Watson

R. Verdolin presented on behalf of chair J. Watson.

The TF met several times over the last year to determine whether there is currently sufficient information available in the existing IEEE documentation or whether a new guide should be developed to address data needs associated with transformer modeling.

After gathering input from users, software vendors and transformer manufacturers, TF concluded that a new guide is needed. The work of the TF included drafting a report that was approved unanimously by all members of the TF.

S. Som assigned R. Verdolin to be chair of a new task force to create a title scope and purpose for a new guide addressing the data needs associated with transformer modeling

4. TF Continuous Revisions to C57.12.00 T. Ansari

T. Ansari presented

Meeting held on Oct 21st, 2025 with 34 out 65 members. We had quorum.

- Painting process of power transformer was brought to task force, team suggested taking it to SC-Power transformer

- A typo error was highlighted by a member. The maximum voltage in table 4 for 69kV class is printed 73kV in in Table 4 of 2010 revision, earlier revisions had 72.5kV, which is in line with C84.1 -2016. A motion to change the value to 72.5kV was passed unanimously.

- New Business- Review all information in table 4 for correction if there is any

- Meeting adjourned at 3:40pm
- Motion – Correct the typo in table 4, change 73kV to 72.5kV

T. Ansari raised motion to change table 4 value from 73kV to 72.5kV, seconded by D. Sauer. Motion passed with unanimous approval. D. Sauer proposed a member of the WG to initiate this change while the group is in ballot so that it may pass faster

5. WG Standard for DPV Transformers C57.159 H. Shertukde

No one from the group presented on their slides

6. TF on PCS Continuous Revisions to Test Code C57.12.90 H. Sahin

H. Sahin presented

- TF meeting started on time on Monday at 9:30 am
- Total attendees were 151. 106 guests and 45/65 members were present, quorum was achieved
- Continued discussions on the clause 5.1, "Determination of cold temperature" for resistance measurements. TF agreed for the Chair to work with transformers manufacturers, collect data on different methods, present the analysis to the TF during the next meeting and try to conclude the revision to this clause
- Started the discussions on the new business to review the applied voltage tolerance during no-load loss and exciting current test. TF agreed to work with transformer manufacturers, collect data on the accuracy of the applied voltage, present the analysis to the TF and decide on the possible tolerance
- Reviewed a new business proposal to define limits for the applied current during load loss and impedance test. TF agreed to work on this new business, starting with cross checking with IEC and other standards.
- Reviewed a new business proposal to test the transformers with the liquid it will operate in the field. TF agreed to hand this business over the Standards group.
- Meeting adjourned on time

7. WG Switching Transients Ind by Xfmr/Bkr Interaction PC57.142 J. McBride

J. McBride Presented.

1) Welcome and Chair's Remarks

2) Circulation of Attendance Sheets (37 of 46 Members were present - quorum was achieved. 87 guests, Total 124 Attendees)

3) IEEE Patent and Copyright Policy Slides (no response)

4) Approval of Agenda and Minutes from Spring 2025 Meeting

5) C57.142 Ballot status and Comment Resolution – Jim McBride

Draft 15 R2

Total Comments – 313

1 Remaining comment for R2

Vote was taken to allow CRG to send email to address this remaining comment.

Plan to proceed with getting the final draft document to REVCom

Approval Rate – 97%

6) Mitigation Methods Task Force Update – The task force will be presenting a tutorial on Thursday here in Bonita Springs, FL USA.

7) There was some discussion of next steps for the task force. General consensus was to continue to meet and discuss ongoing issues. A suggestion was made to begin additional revisions to the standard.

8) Meeting adjourned at 11:54 AM

J. McBride motioned for a PAR extension in the event that the last comment will not be resolved in time. A. Joshi seconded. Motion passed with unanimous approval.

8. WG Guide for Application of Tertiary & Stabilizing Windings C57.158 E. Betancourt

E. Bentacourt presented.

Meeting Date / Time : Oct 21, 2025 @ 4:45PM to 6:00PM

66 Total attendees, consisting of 17 members and 49 guests. The WG did not achieve a quorum (18 members required). 12 Guests requested membership.

Old Business:

The Group could not conduct regular business.

The Chair presented status of straw ballot within the Group. Two Members have responded to date with comments, and several Members did not receive the communication.

Changes to original document of C57.158 were briefly presented to the Group, to encourage pending responses.

Following with agreements from the WG's Spring meeting, the straw ballot will be finished with objective to get final draft ready for the Spring 2026 meeting.

The minutes from the previous meeting will be approved by e-mail.

The meeting was adjourned by 5:45 PM.

9. WG IEEE Neutral Grounding Devices PC57.32 S. Kennedy

S. Kennedy presented.

The Working Group met at 4:45 PM on Tuesday October 21, 2025.

16 members were present of the 21 total membership achieving quorum. An additional 24 guests were present.

Revisions have been worked on for two years. The results of the circulated draft of the standard were reviewed. There were 45 comments with 18 being technical. The others were editorial and corrected by the Secretary. Technical comments had been sent to the Task Force Chairs of the devices: Neutral Grounding Reactors, Neutral Grounding Transformers, Neutral Grounding Resistors, Neutral Ground Fault Neutralizers and Combination Devices. All resolutions were discussed and approved at the meeting. The Secretary will finish those changes to the draft. After discussion, there were no more comments made on the draft by the working group.

IEEE C57.32 -2015 expires on 12/31/2025. The PAR is good through 12/31/2027. It is important to get the standard to ballot.

Ryan Hogg made the motion to request permission from PCS to submit the revised draft to begin the ballot process. Kurt Kainedar seconded the motion. After discussion, this was approved by over 75 % of the Working Group.

Two of the guests, Benjamin Guinand and Thomas Keels, achieved membership at the end of the meeting.

The meeting adjourned at 6:10 pm.

S. Kennedy made a motion to move the draft of C57.32 to SA ballot to IEEE. D. Sauer seconded the motion. The motion passed with unanimous approval.

10. WG Entity Winding Deformation Guide PC57.141 X. Shao (P. Patel)

Motion made by X. Shao to extend the PAR for C57.141. Seconded by D. Sauer. Motion passed with unanimous approval

11. PC57.120, IEEE Guide for Loss Evaluation of Dist. and P. Transf. and React. R. Verdolin

R. Verdolin presented
Meeting held Monday at 3:15 PM

- 37 in attendance, 14 members attended, 23 guests
- The PAR expiration: 12/31/2029, current guide goes to IR 2027
- Presentation of document background presented by Wallace Binder
  - Driving goal of the document for consistency in methods and definitions
  - Review of Energy Information Administration's Annual Energy Outlook report
  - Question posed to WG: "How many users rely on the EU or DOE efficiency standards to price transformers vs. performing evaluations using methods in C57.120 or EEI?"
- Review of the draft document C57.120/D1
- Call for volunteers for section/specific task forces
  - Overview – led by Kris Zibert
  - Definitions, Acronyms, Abbreviations – led by Kris Zibert
  - Loss Evaluation Parameters – led by Mike Nolte
  - Transformer Loss Evaluation – led by Wallace Binder
  - Annex A – Formulas, Tables, and Figures – led by Rogerio
  - Annex B – Description of Transformer Power Losses – led by Rogerio
- LOOKING FOR ADDITIONAL VOLUNTEERS TO HELP WITH SECTION UPDATES

12. TF – Xfmrs for wind turbine application IEC/IEEE 60076-16 S. Debass

- Total Attendance – 73

- Membership Request – 28
- Guest - 41
- Unspecified – 4
- A motion was made to proceed with preparing the PAR and begin scope development for the dual logo revision
- The group confirmed that the scope excludes collector transformers, as they do not experience the same vibration conditions as transformers located inside the nacelle, tower, or base of individual wind turbines. The standard intends to cover transformers that connect the turbine to the collector system, not the large collector transformers themselves.
- Discussed increasing voltage class range to include 150kV and the need to evaluate PD performance for wind farm transformers

S. Debass made a motion to pursue the document as a dual logo with IEC. D. Ayers seconded. Motion passed with unanimous approval.

13. TF C57.109 Through Fault Current Duration S. Hoffman

S. Hoffman presented.

- The first meeting of the task force took place at 8:00 AM on Tuesday October 21, 2025.
- There were 66 attendees, 40 attendees requested membership.
- Patent and Copyright Slides were presented. No patent claims were brought forward.
- There was discussion about the need to update the document, particularly in the following areas: History or background for the current curves, possibly add equations for the curves, Impact of reverse power flow, and Considerations for Three winding transformers
- The Task Force approved a motion to make a motion to the Subcommittee to initiate a PAR with the existing language for Title, Scope and Purpose.
- In addition to existing officers, Akash Joshi volunteered to be Secretary of the future Working Group.
- The meeting ended at 9:00 AM. The work of this task force is complete, and there are no future meetings planned.

S. Hoffman made a motion to submit a PAR with the proposed title, scope and purpose. J. Varnell seconded. Motion passed with unanimous approval.

14. TF C57.110 Xfmr Capability when supplying non-sinusoidal Load Currents S. Narawane

A. Levin presented on behalf of the chair S. Narawane.

We met at Hyatt, Bonita Springs, in Blue Heron room on 21st Oct from 3.15 pm to 4.30 pm to discuss the Title, Scope and Purpose of C57.110 for PAR.
This was the 1st Meeting held.
There were various discussions about the Title, Scope and Purpose.
After the discussions, the TF agreed to keep the Title, Scope and Purpose as is.
A motion to submit the PAR was unanimously approved.

A, Levin made a motion to submit the PAR of C57.110 with the title, scope, and purpose. K. Adams seconded. Motion passed with unanimous approval.

J.6 Unfinished (Old) Business

There was no unfinished business.

J.7 New Business EPM Review of P0161 – PAR S. Kennedy

S. Kennedy presented on a Chinese entity PAR on voltage harmonic distortion that caused two failures on distribution type transformers. They claimed C57.110 and C57.18.10 don't apply because they are on current harmonics. We should not immediately just to a new standard for only two transformer failures, getting white papers and industry comments should come first. A white paper was done subjecting the transformer to harmonic voltages and currents with different frequencies. These tests would show an expected result but nothing novel. The test method was very complex for distribution transformers testing over 2000 Hz range for different harmonics and suggested it being a standard test.

D. Sauer asked if the testing was being contemplated at rated voltage or if it was similar to an SFRA test. S. Kennedy replied it was not similar to any testing we currently have.

A survey was conducted in PCS and Power transformer subcommittee, since the response was not sufficient it was proposed to survey distribution and dry type transformer subcommittees before sending a reply to the entity group. The response received so far showed two 'not approved' with lengthy clarifications.

W. Li suggested looping in the IEEE P519 for this topic

J.8 Adjournment

- **The meeting was adjourned at 4:13 PM**

J.9 Minutes of Meetings of Working Group (WG) and Task Force (TF) Reports (all unapproved)

J.9.1 WG Eval Guide Environ Impact of Trans & Reactors PC57.151 J. Kazmierczak

Technical Activity Reports
IEEE Guide for the Evaluation of the environmental impact & life cycle assessment of Transformers & Shunt Reactors
2025 Fall Meeting, Hyatt Regency Bonita Springs, Florida, USA
Monday, October 20, 2025– 11:00 AM to 12:15 PM Pacific Time Zone

Chair	Vice Chair	Secretary
J. Kazmierczak Hitachi Energy	Ismail Guner Hydro Quebec	Elise Arnold SGB-SMIT Group

- This is the third meeting of the guide after receiving PAR.
- A call to order was made at 11:00 AM
- The patent & copyright policy was reviewed. A call for any patents was made. No Patents were announced.
- Quorum was taken but not achieved
- There are 58 total attendees, with only 25 members. 37 Members were need for quorum
- The Agenda was presented. No motion can be made due to lack of quorum
- Approval of MoM's from Denver could not be made.
- The status of the Cigre guide was presented by Myles Margot. His presentation will be avaialable in the IEEE WG. The guide should have a draft by early 2026. It was suggested to look at the structure of the work packages that Cigre has established.
- Comment from Cargill regarding EPA not distinguishing the difference between petroleum & natural esters & if Cigre will consider this.
- Francis Mills Power Engineers, asked if the Cigre document (when draft is published in 2026) will be reviewed by the group to take as input for the guide.
- Louis Hitachi Energy, Life Cycle Thinking should be changed to consideration
- Poorvi Patel Hitachi Energy, commented that the document for section 3 should be distributed for comments. It will be distributed after this meeting.
- At international Cigre in Montreal EDF presented a lifecycle analysis of liquids that may be useful for the guide
- A chart overview of who is leading what with deadlines was requested.
- A call for any new business was made. No new business was brought up.
- The meeting was adjourned at 10:48

IEEE/PES Transformers Committee
Guest Roster

IEEE Guide for the Evaluation of the environmental impact & life cycle assessment of Transformers & Shunt Reactors
MEEting Location: Fall 2024 – St. Louis, Missouri, USA 11 :00AM-12 :15AM CST
date: October 28, 2024

	Last Name	**First Name**	**Company (Affiliation)**	**Role**
1.	Giraldo	Orlando	The HJ Family of Companies	Member
2.	Verdolin	Rogerio	Verdolin Solutions	Member
3.	Shull	Stephen	BBC Electrical Services Inc.	Guest
4.	Bohrn	Joshua	Pacificorp	Member
5.	Vanderwalt	Alwyn	ECI	Member
6.	Munoz	Marta	Hitachi energy	Member
7.	Tenyenhuis	Ed	Hitachi Energy	Member
8.	Matthews	Lee	Howard Industries	Member
9.	Machain	Jose Luis	Prolec GE	Member
10.	Sohail	Muhammad Abdullah	Trench Limited	Member
11.	Ziger	Igor	Koncar	Member
12.	Tan	Jonathan	Northern Transformer	Member
13.	Tanaka	Troy	Burns & McDonnell	Guest
14.	Greaves	Brad	Weidmann Electrical Technology	Member
15.	Hossain	Saif	Trench Canada	Member

	Last Name	First Name	Company (Affiliation)	Role
16.	Tolcachir	Eduardo	TTE Transformers	Member
17.	Doak	Eric	D4 Energy Solutions	Member
18.	Sweetser	Charles	Omicron	Guest
19.	Parkinson	Dwight	Eaton	Member
20.	Rehkopf	Sebastian	Reinhausen Germany	Member
21.	Plotner	Chris	Siemens Energy	Guest
22.	Foata	Marc	MR	Guest
23.	Wallach	David	Duke Energy	Guest
24.	Boettger	William	Boettger Transformer Consulting LLC	Member
25.	Chelgi	Bhaumile	Hitachi Energy	Guest
26.	Masathe	Swapnil	Megger	Guest
27.	Mahajan	Kushal	Sungrow	Member
28.	Bolar	Sanket	Oncor	Member
29.	Schiessl	Markus	SGB	Member
30.	Dillon	Nikolaus	Dominion Energy	Member
31.	Sharp	Michael	Trench Limited	Member
32.	Bhardwaj	Naveen	Trench Group	Member

	Last Name	First Name	Company (Affiliation)	Role
33.	Wong	Terry	Trench Limited	Member
34.	Calil	Wilerson	Hitachi Energy	Member
35.	Natale	Anthony	HICO America	Guest
36.	Khan	Hasim	NEETRAC – Georgia Tech	Member
37.	Kapka	Serivoz	Hitachi Energy	Guest
38.	Kiwathahshin	Matenz	Hitachi Energy	Guest
39.	Aleksandrowicz	Danieal	Hitachi Energy	Member
40.	Kowalski	Rafal	Hitachi Energy	Member
41.	Casallas	Camilo	Trench	Member
42.	Mbovombolo	Mama	Hitachi Energy	Member
43.	Herron	Bill	Reinhausen	Member
44.	Sen	John	Duke Energy	Member
45.	Hogg	Ryan	Bureau of Reclamation	Guest
46.	Thompson	Jim	T&R Service Co.	Member
47.	Patel	Sanjay	SGB-SMIT USA	Guest
48.	Joshi	Akash	Kimley-Hoorn	Member
49.	Garcia	Miguel	Hitachi Energy	Member

	Last Name	First Name	Company (Affiliation)	Role
50.	Hugo	Avila	Hitachi Energy	Member
51.	Mani	Kumar	Duke Energy	Member
52.	Trifunoski	Risto	Trench Canada	Member
53.	Delgado	Gabrial	Invernergy	Member
54.	Nolte	Michael	Kiewit	Member
55.	Gyore	Attila	Midel	Member
56.	Dorpmanns	Luc	Royal SMIT Transformers	Member
57.	Schrammel	Alfons	Siemens Energy	Member
58.	Kaineder	Kurt	Trench Austria	Member
59.	Ansari	Tauhid	Hitachi Energy	Member
60.	Thomas	Scott	Hitachi Energy	Guest
61.	Swatkowski	Michael	Hitachi Energy	Member
62.	Patel	Yakesh	Hitachi Energy	Member
63.	Dragana	Gasic	Koncar Dist.	Guest
64.	Diodan	Janko	Koncar Dist	Guest
65.	Weyandt	Paul	Schneider Electric	Member
66.	Neder	Frank	Trench Germany	Member

	Last Name	First Name	Company (Affiliation)	Role
67.	Patel	Poorvi	EPRI	Member
68.	Gustavsson	Niklas	Hitachi Energy	Member
69.	Labh	Ashwini	Hitachi Energy	Member
70.	Cheim	Luiz	Hitachi Energy	Member
71.	Fu	Peng	Chint	Guest
72.	Mills	Francis	Power Engineers Inc.	Member
73.	Luka	Kovacic	Koncar Instrument Transformers	Member
74.	Crown	Alexander	Coil Innovation	Guest
75.	Wirth	Stefan	Coil Innovation	Guest
76.	McBride	Jim	JMX High Voltage	Guest
77.	Gamboa	Jose	The H-J Family of Companies	Guest
78.	Bayena	Hugo	The H-J Family of Companies	Guest
79.	Schott	Cody	The H-J Family of Companies	Guest
80.	Richardson	Michael	Ameren	Guest
81.	Frazier	Raymond	Ameren	Guest
82.	Radbrandt	Vif	Hitachi Energy	Guest
83.	Schleismann	Eric	Southern Company	Guest

	Last Name	First Name	Company (Affiliation)	Role
84.	Furlanetto	Carlo	Siemens Energy	Guest
85.	Hanson	Corey	Flex-Core	Member
86.	Orozco	Eduardo	GE Grid Solutions	Member
87.	Post	Nicholas	WEC Energy Group	Guest
88.	Vir	Dharam	Prolec GE Waukesha	Member
89.	Varghese	Ajith	Prolec GE Waukesha	Member
90.	Steele	Hampton (Allen)	TVA	Member
91.	Saad	Mickel	Hitachi Energy	Member
92.	Dopplmair	Peter	Trench Group	Guest
93.	Mendez	Omar	Prolec GE	Member
94.	Avelino	Paulo	Hitachi Energy	Guest
95.	Megdad	Mohammed	IPS	Member
96.	Betancourt	Edwin	Siemens Energy	Member
97.	Bernesjo	Mats	Hitachi Energy	Guest
98.	Kirchenmayer	Egon	Siemens Energy	Member
99.	Do Prado	Gustavo	Siemens Energy	Guest
100.	Rossini	Yuri	Siemens Energy	Guest

	Last Name	First Name	Company (Affiliation)	Role
101.	Mamede	Gabriel	Siemens Energy	Guest
102.	Mantoan	Francis	Siemens Energy	Guest
103.	Taylor	Marc	JFE Shoji Canada	Member
104.	Leal	Fernando	Prolec GE	Member
105.	Som	Sanjib	PTT, LLC	Member
106.	Arnold	Elise	SGB SMIT	Officer - Secretary
107.	Guner	Ismail	Hydro Quebec	Officer - Vice Chair
108.	Kazmierczak	Jerzy	Hitachi Energy	Officer - Chair

J.9.2 TF Audible Sound Revision to Test Code **R. Girgis**

Unapproved Minutes of Fall 2025 TF "Audible Sound Revision to Test Code" Meeting

The TF met at 1:45 PM, on Monday, October 20, 2025. Dr. Ramsis Girgis, Chairman of the TF, requested Mats Bernesjo (Secretary) to preside over the meeting.

The Secretary welcomed the audience of this meeting, had all participants introduce themselves, and reviewed the proposed agenda. The proposed agenda was unanimously approved (Sanjib Som1st, John Sen 2nd) as was the unapproved minutes of the Spring 2025 TF meeting in Denver (Hugo Flores 1st, David Wallach 2nd).

The TF meeting was attended by 46 out of 78 members for a total meeting attendance of 76. Hence, a quorum was established. 7 attendees requested membership at this meeting (listed below) **.

First, the secretary gave:

1. A summary of previous work performed over the last two meetings on the proposed addition to the IEEE Noise Guide, C57.136.

2. Review of the proposed addition to the Noise Guide, C57.136

3. Summary of results from the questionnaire sent to manufacturers of Power Transformers on the proposed addition to C57.136.

4. Revised text of the proposed addition to the Noise Guide, C57.136 after results of the questionnaire were incorporated

Mr. Joe Foldi asked whether the proposed addition to the IEEE Noise Guide would be better suited as a Tutorial to TF, or whether it should still be included in the Guide. The chairman explained the purpose of the proposed procedure and what the TF agreed to earlier to include this procedure into the Guide to help manufacturers specify the sound level of the PA to limit the impact of the PA noise on the sound level of the main transformer.

A motion by Ajith Varghese, 2nd by Dan Sauer, that the latest revision of the proposed Addition to the Noise Guide is surveyed at the TF after this meeting. This motion was approved unanimously.

Sanjib Som asked whether, in the very rare cases when a PA is installed in a separate pocket, the PA noise would have a higher impact on the noise of the main transformer.

The secretary stated that the presentation given at the TF meeting will be shared with the attendees of this meeting along with the unapproved minutes of the meeting.

Finally, the Chairman, Dr. Ramsis Girgis, announced that he is respectfully resigning as the Chairman of this Task Force since he may not be able attend every future IEEE Transformers Standards meeting. He had previously communicated with Mr. Steve Antosz to take over the responsibility of the Chairmanship of this TF which he accepted. However, procedurally, Sanjib Som suggested that Dr. Girgis will need to get the approval of the PCS for Mr. Antosz to become the new chairman of the TF.

With no new additional business raised, the meeting was adjourned upon unanimous approval (Sanjib Som 1st, Onome Avanoma 2nd)

Respectfully submitted,

Mats Bernesjo, TF Secretary

Attached are the slides presented at the meeting that include the details and responses to the questionnaire. Also attached are 3 slides that include the revised text of the proposed attachment.

** Attendees requested membership

Dumitru Diaconu (Delta Star), Said Ersoy (Eaton), John John (Virginia Transformer Corp.), Akash Joshi (Kimley-Horn), Nihat Kosedagi (ERMCO), Arvind Kumar (Delta Star Inc.), and Jose Sanchez Rodriguez (Vertiv)

2025 Fall Meeting Attendance and Affiliation is as follows:

Karina	Albacete	Siemens Energy	Observer
Stephen	Antosz	Stephen Antosz & Associates, Inc	Member
Elise	Arnold	SGB	Member
Onome	Avanoma	MJ Consulting	Member
Duvier	Bedoya	Hitachi Energy	Member
Orlando	Benitez	Hyosung HICO	Observer
Mats	Bernesjo	Hitachi Energy	Member
Enrique	Betancourt	Prolec GE	Member
William	Boettger	Boettger Transformer Consulting LLC	Member
Michael	Botti	Hyosung HICO	Member
Darren	Brown	Howard Industries	Member
Wilerson	Calil	Hitachi Energy	Member
Alfredo	Carrizales	Prolec GE	Member
Adriana	Cisco Sullberg	Salt River Project	Member
Anthony	Coker	Shell	Observer

Scott	Dennis	Hitachi Energy	Member
Dumitru	Diaconu	Delta Star	Request Membership
Paul	Dolloff	EKPC	Observer
Said	Ersoy	Eaton	Request Membership
Hugo	Flores	ERMCO	Member
Joe	Foldi	F&A	Member
Farnci	Fontana	Siemens Energy	Observer
Raymond	Frazier	Ameren	Member
Carlo	Furlanetto	Siemens Energy	Observer
Eduardo	Garcia Wild	Siemens Energy	Member
Ramsis	Girgis	Hitachi Energy	Member
Shawn	Gossett	Ameren	Observer
Bill	Griesacker	W. Griesacker & Associates	Member
Nicholas	Jensen	Delta Star Inc.	Member
John	John	Virginia Transformer Corp.	Request Membership
Akash	Joshi	Kimley-Horn	Request Membership
Qasim	Khan	Georgia Tech-Neetrac	Observer
Dohyung	Kim	HD Hyundai Electric	Observer
Nihat	Kosedagi	ERMCO	Request Membership

Rafal	Kowalski	Hitachi Energy	Member
Arvind	Kumar	Delta Star Inc.	Request Membership
Mark	Lachman	Doble	Member
Fernando	Leal	Prolec	Member
Ricardo	Lopes	EFACEC	Observer
Francis	Mills	Power Engineers Inc	Member
Juliano	Montahna	Siemens Energy	Member
Francisco	Montoya	Siemens Energy Srl	Observer
Gianetta	Morrow	CamTran	Observer
Cuanhtemol	Ortiz	Niagara Transformer	Member
Nitesh	Patel	Hyundai Power Transformers	Member
Klaus	Pointner	Trench Austria GmbH	Member
Bertrand	Poulin	Hitachi Energy	Member
Jesus Sanchez	Rodriguez	Vertiv	Request Membership
Marnie	Rousell	Entergy	Member
Christopher	Rutledge	GE Vernova	Observer
Hakan	Sahin	Virginia/Georgia Transformer	Member
Daniel	Sauer	EATON Corporation	Member
Markus	Schiessl	SGB	Member
Cihangir	Sen	Duke Energy	Member
Abdulmajid	Shaikh	Delta Star	Member

Michael	Sharp	Trench Ltd Canada	Member
Andre	Simons	JFE Shoji	Member
Christopher	Slattery	FirstEnergy Corp.	Member
Jason	Snyder	FirstEnergy Corp.	Member
Sanjib	Som	Pennsylvania Transformer	Member
Seoyun	Song	Hyosung HICO	Observer
Vedrana	Starcevic Prebeg	Koncar D&T	Observer
Andy	Steineman	Delta Star Inc.	Member
Michal	Swiatkowski	Hitachi Energy	Member
Marc	Taylor	JFE Shoji Power Canada Inc.	Member
Ajith	Varghese	SPX Transformer Solutions, Inc.	Member
Jason	Varnell	Doble Engineering Co.	Member
John	Wagner	AEP	Observer
David	Wallach	Duke Energy	Member
Jeffrey	Wright	Duquesne Light	Member
Fei	Yang	Hitachi Energy	Member
Kris	Zibert	Allgier Martin	Member
Amitkumar	Singh	ConEd	Observer
Kyungchan	An	Hyosung	Observer
	Saif	Trench Limited	Observer
David	Herrington	Pennsylvania Transformer	Observer

J.9.3 TF PCS Continuous Revisions to C57.12.00 **T. Ansari**

PCS Task Force on General Requirements C57.12.00

Performance Characteristics Subcommittee
IEEE / PES Transformers Committee

October 21, 2025
Bonita Springs, Florida

UNAPPROVED MINUTES

The PCS Task Force on General Requirements for C57.12.00 met at 3:15 PM on Tuesday, October 21, 2025. Chairman Tauhid Ansari presided over the meeting together with Vice Chair Enrique Betancourt and Mats Bernesjo as the secretary. The meeting was called to order, and the Chairman reminded the group of the purpose and scope of this Task Force. The copyright and patent statements from IEEE were presented to the group; none of the members and guests present were aware of any issues related to this TF's activities.

The meeting was attended by **34** voting members (out of **65**), 28 observers, for a total meeting attendance of 77 people, including 15 requests for membership at this meeting. A quorum was established with 34 / 65 = 52 % attendance.

The agenda was unanimously approved (1st Hugo Flores, 2nd Phil Hopkinson). The unapproved minutes from the previous meeting (Spring meeting, Denver, 2025) was unanimously approved (1st Hugo Flores, 2nd Phil Hopkinson).

The following 15 guests requested membership:

Amitkumar Singh (Consolidated Edison Company of New York), Arvind Kumar (Delta star inc), Can Tekyetim (Hitachi Energy), Dwight Parkinson (Eaton Corp), Fernando Tirado (Prolec GE), Garrett Bradshaw (Howard Industries, Inc.), Jesus Sanchez Rodriguez (Vertiv), Joseph Foldi (Foldi & Associates inc), Juliano Montanha (Siemens Energy), Muhammad Abdullah Sohail (CES Transformers), Nihat Kosedagi (ERMCO), Sanjib Som (PA Transformer), Saramma Hoffman (PPL), Scott Thomas (Hitachi Energy), Shawn Gossett (Ameren)

Next, the Chair briefly provided background and relevance of each item brought up for Group's discussion in the agenda. The Chair started Group's regular business.

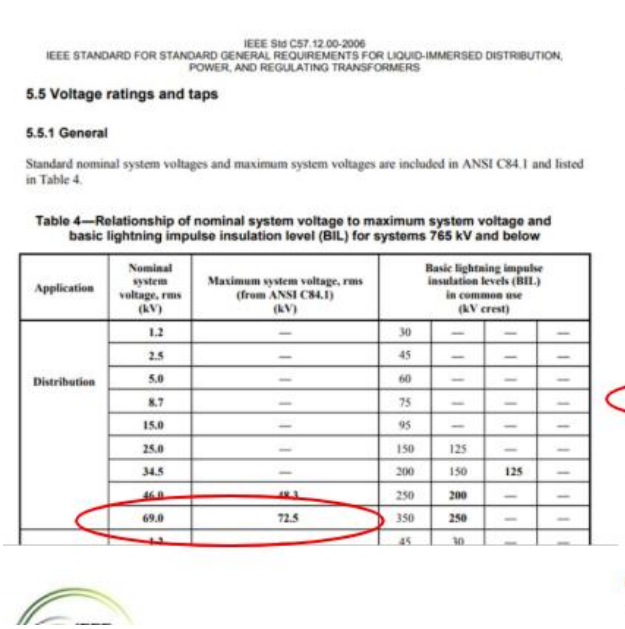
WG Item 119, Paint application for various environmental conditions - Monil Patel

Mr. Monil Patel brought up the subject of Coatings on Class II power transformers since there is currently no IEEE standard that explicitly dictates coating requirements for power transformers. He requested that the transformer committee develop guidelines or standards for coastal application that list various options and expected life as this will help users correctly specify their requirements and help vendors to quote to same requirements instead of assuming high-cost options which may put them at disadvantage w.r.t to other vendors.

Mr. Sanjib Som stated that this topic is not to be covered by the PCS. It was decided / requested that this item is brought up with the Power Transformer Sub-Committee for further action.

WG Item 120, Maximum system voltage changed from 72.5 to 73kV in Table 4 of the 2010 revision of the Standard - Chris Whitten.

Chairman Ansari introduced this topic suggested by Mr. Chris Whitten who observed that there appears to be a typo in the 2010 revision of the Standard. The maximum system voltage was changed from 72.5 kV to 73 kV.



IEEE Std C57.12.00-2006
IEEE STANDARD FOR STANDARD GENERAL REQUIREMENTS FOR LIQUID-IMMERSED DISTRIBUTION, POWER, AND REGULATING TRANSFORMERS

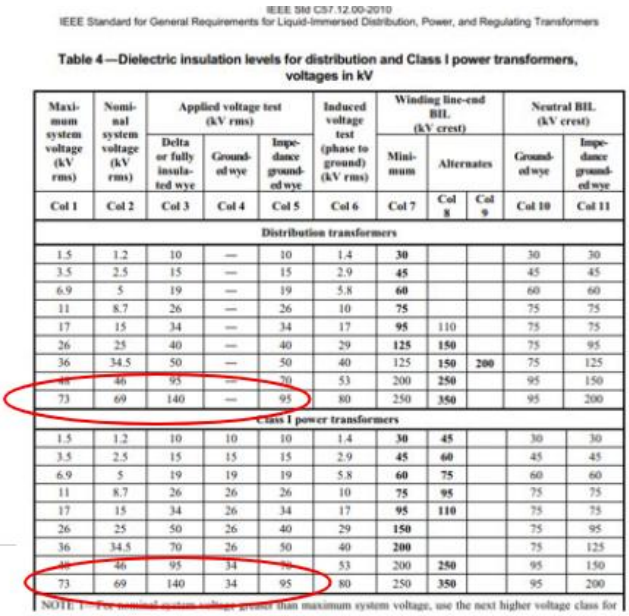
5.5 Voltage ratings and taps

5.5.1 General

Standard nominal system voltages and maximum system voltages are included in ANSI C84.1 and listed in Table 4.

Table 4—Relationship of nominal system voltage to maximum system voltage and basic lightning impulse insulation level (BIL) for systems 765 kV and below

Application	Nominal system voltage, rms (kV)	Maximum system voltage, rms (from ANSI C84.1) (kV)	Basic lightning impulse insulation levels (BIL) in common use (kV crest)			
Distribution	1.2	—	30	—	—	—
	2.5	—	45	—	—	—
	5.0	—	60	—	—	—
	8.7	—	75	—	—	—
	15.0	—	95	—	—	—
	25.0	—	150	125	—	—
	34.5	—	200	150	125	—
	46.0	48.3	250	200	—	—
	69.0	72.5	350	250	—	—
	1.2		45	30	—	—



IEEE Std C57.12.00-2010
IEEE Standard for General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers

Table 4—Dielectric insulation levels for distribution and Class I power transformers, voltages in kV

Maximum system voltage (kV rms)	Nominal system voltage (kV rms)	Applied voltage test (kV rms)			Induced voltage test (phase to ground) (kV rms)	Winding line-end BIL (kV crest)			Neutral BIL (kV crest)	
		Delta or fully insulated wye	Grounded wye	Impedance grounded wye		Minimum	Alternates		Grounded wye	Impedance grounded wye
Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10	Col 11
Distribution transformers										
1.5	1.2	10	—	10	1.4	**30**			30	30
3.5	2.5	15	—	15	2.9	**45**			45	45
6.9	5	19	—	19	5.8	**60**			60	60
11	8.7	26	—	26	10	**75**			75	75
17	15	34	—	34	17	**95**	110		75	75
26	25	40	—	40	29	**125**	**150**		75	95
36	34.5	50	—	50	40	125	**150**	**200**	75	125
48	46	95	—	70	53	200	**250**		95	150
73	69	140	—	95	80	250	**350**		95	200
Class I power transformers										
1.5	1.2	10	10	10	1.4	**30**	**45**		30	30
3.5	2.5	15	15	15	2.9	**45**	**60**		45	45
6.9	5	19	19	19	5.8	**60**	**75**		60	60
11	8.7	26	26	26	10	**75**	**95**		75	75
17	15	34	26	34	17	**95**	**110**		75	75
26	25	50	26	40	29	**150**			75	95
36	34.5	70	26	50	40	**200**			75	125
48	46	95	34	70	53	200	**250**		95	150
73	69	140	34	95	80	250	**350**		95	200

NOTE 1—For nominal system voltage greater than maximum system voltage, use the next higher voltage class for

A fruitful discussion was held between the members & guests of the workgroup with feedback in regard to this matter. Mr. Antoz suggested that during the present ballot, changing this value could be suggested to the ballot resolution team. Mr. Varnell also agreed that this could easily be changed with the comment that we need to look into the reference to this system voltage (as well as some of the other voltages to make sure there are no other errors such as the ANSI Standard referred to in Clause 4.1.6.2).

The consensus from the WG was to motion the following (Bertrand Poulin 1st, Hugo Flores 2nd):

"Replace the 73 kV value with the original value of 72.5 kV in Table 4 of C57.12.00".

A vote within the WG to add the above note resulted in 28 approve, no votes against nor any abstain. Hence, the proposed motion passed. The write up will be passed on to the correct instance.

New topics / Action items

- Review the other nominal system voltages in Table 4 to make sure that there are no rounding-up or rounding-down errors in the kV values.

With a quiet floor, the Chairman asked for the meeting to be adjourned (1st Hugo Flores, 2nd by Phil Hopkinson).

Meeting was adjourned at 3:40 PM.

Respectfully submitted,

Tauhid Ansari	Enrique Betancourt	Mats Bernesjo
Chair	Vice-Chair	Secretary

Attendance Fall 2025 Meeting – PCS TF to Revision C57.12.00

AbdulMajid Shaikh	Delta Star Inc.	Member
Ajith Varghese	Prolec GE Waukesha	Member
Amitkumar Singh	Consolidated Edison Company of New York	Request membership
Andreas Thiede	HIGHVOLT Dresden	Observer
Arvind Kumar	Delta star Inc.	Request membership
Bertrand Poulin	Hitachi Energy	Member
Can Tekyetim	Hitachi Energy	Request membership
Carlos Gaytan	Prolec GE	Observer
Christopher Baumgartner	We Energies	Member
Christopher Slattery	FirstEnergy	Member
Cihangir Sen	Duke Energy	Member
Darren Brown	Howard Industries	Member
David Ramos	MGM Transformers	Observer
David Wallach	Duke Energy	Member
Dohyung Kim	HD Hyundai electric	Observer
Donald E. Ayers	Ayers Transformer Consulting	Member
Dragana Gasic	Koncar D&ST	Observer
Duvier Bedoya	Hitachi Energy	Member
Dwight Parkinson	Eaton Corp	Request membership
Elise Arnold	SGB-SMIT	Member
Emil Milea-Ciobanu	Delta Star	Observer
Enrique Betancourt	Prolec Energy	Member
Fei Yang	Hitachi Energy	Member
Fernando Tirado	Prolec GE	Request membership
Francis Mills	POWER Engineers	Member
Garrett Bradshaw	Howard Industries, Inc.	Request membership

Gary King	Independent	Observer
H Allen Steele	TVA	Observer
Harry Pepe	Doble Engineering	Member
Hector Villa	Ecuatran SA	Observer
Hugo Flores	Ermco-ECI	Member
Jameson Leach	Raytech USA	Observer
Jason Varnell	Doble Engineering	Member
Jesus Nunez	MGM Transformers	Member
Jesus Sanchez Rodriguez	Vertiv	Request membership
Joe Nims	Allen & Hoshall	Member
John Herron	Raytech	Observer
Joseph Foldi	Foldi & Associates inc	Request membership
Juan Castro	Magnetron	Observer
Juliano Montanha	Siemens Energy	Request membership
Kris Neild	Megger	Member
Mamoon Staya	Hitachi Energy	Observer
Marcelino Perez	Prolec	Observer
Mark Lachman	Doble	Member
Marnie Roussell	Entergy	Member
Mats Bernesjo	Hitachi	Member
Michael Botti	Hyosung HICO	Member
Michael Shannon	Rea Magnet Wire	Observer
Monil Patel	Pacific Gas and Electric	Member
Monil Patel	Pacific Gas and Electric	Observer
Muhammad Abdullah Sohail	CES Transformers	Request membership
Muhammad Imran Yousaf	Hitachi Energy	Observer
Naveen Bhardwaj	Trench Geoup	Observer
Nihat Kosedagi	ERMCO	Request membership
Onome Avanoma	MJC	Observer
Philip Hopkinson	HVOLT	Member
Pooneh Davoodi	Delta Star	Member

Qasim khan	Georgia Tech-NEETRAC	Observer
Raymond Frazier	Ameren	Member
Richard von Gemmingen	Dominion Energy	Observer
Sanela Carevic	KONCAR D&ST	Observer
Sanjib Som	PA Transformer	Request membership
Saramma Hoffman	PPL	Request membership
Schleismann	Southern Company	Observer
Scott Dennis	Hitachi Energy	Member
Scott Thomas	Hitachi Energy	Request membership
Seoyun Song	Hyosung HICO	Observer
Seungmo Kim	Hyosung HICO	Observer
Shawn Gossett	Ameren	Request membership
Shelby Walters	Howard Industries	Observer
Sheldon Kennedy	Sheldon P Kennedy Engineering PLLC	Member
Stephen Antosz	Consultant	Member
Steven Hegerle	Howard Industries	Observer
Steven Snyder	Hitachi Energy	Member
Tauhid Ansari	Hitachi	Member
Vedrana Starcevic Prebeg	Koncar D&ST	Observer
Zan Kiparizoski	Howard Industries	Member

J.9.4 WG Standard for DPVTs C57.159 **H. Shertukde**

Performance Characteristics Subcommittee

Working Group C57.159: Standard for Distributed Photo-Voltaic Transformers (DPVTs)

Unapproved Meeting Minutes

Fall 2025 Meeting
October 20, 2025, 4:45pm
Room Colusa D/E
Hyatt Regency Coconut Point Resort
Bonita Springs, FL

The meeting was called to order at 4:46PM EDT by Chair Hem Shertukde. Vice-Chair Phil Hopkinson and Secretary David Walker were present.
12 Members attended, and 35 guests. The WG has 20 total members, and, thus, a quorum was achieved.

Phil Hopkinson moved to approve the agenda as written, David Walker seconded. Passed unanimously. Paul Weyandt moved to approve the minutes from Denver, Spring 2025 meeting as written. Huan Dinh seconded. Approved unanimously

The chair presented the patent and copyright slides. No issues arose.

Chair presented the current draft and started from where the 10/10/25 virtual meeting ended. Section 4.2 which was updated by Joe Watson and section 4.3 which was updated by Carlos Gaitan were presented.

Sasha Levin suggested setting up a task force to integrate information from the existing guide into the new standard and, also, add new information. Chair said that this already happened several meetings ago. Sasha Levin said that document appears to be more of a guide rather than a standard. David Walker suggested that the document was currently informative and not normative. Thus, more like a guide rather than a standard

Sasha Levin made a motion to form a task force to develop the structure of the document and decide what material should be used from the existing guide. Jason Beaudoin seconded the motion. A vote was conducted and the motion passed unanimously. Phil Hopkinson, Paul Weyandt, Wolfgang Schmidt, Juan Rodriguez, Brad Staley, David Walker, and Hem Shertukde volunteered to help on the task force, Sasha Levin volunteered to be task force leader.

Phil Hopkinson presented that solar transformers have been exhibiting gassing problems. Phil mentioned that ground loop problems can occur when connecting the inverter neutral to the transformer LV neutral. The voltage created by transforming the current by the turns ratio could overvoltage the HV. Hem mentioned that the design of the inverter was important to the harmonics generated by the inverters. That inverter design and the use of filters can make a large difference to the system performance.

Carl Jacob asked what types of gasses were detected in the gassing problems that Phil mentioned. Phil H said that Hydrogen, Ethylene, and other high temperature gasses have been seen. Less gassing with FR3 but not zero. For mineral oil Phil has seen up to 2000ppm of Hydrogen. Very near explosive limit. Phil mentioned that core electrostatic shields can reduce the gassing. Wolfgang Schmidt suggested that the standard must clarify what type of harmonics are important- line-line, line-neutral, etc. Standard needs to provide do's and don'ts and quantify the issues- how much current and voltage harmonic are acceptable.

The meeting was adjourned at 6:00 EDT.

Full Name	Employer	Participation
Arteaga, Javier	Hitachi Energy	Guest
Ayala, Alejandro	Ermco	Guest
Beaudoin, Jason	Weidmann Group	Member
Biggie, Kevin	Weidmann Group	Member
Boettger, William	Boettger Transformer Consu	Member
Bray, Elizabeth	Southern Co	Guest
Brooks, Jeffrey	NEI Power Engineering	Guest
Castro, Juan	Unilied	Guest
Chrysler, Rhett	Ermco	Guest
Crockett, Janet	Fayetteville PWC	Guest
Dappen, Tim	Cargill	Guest
Delgado Zamora, Gabriel	Invenergy	Member
de Olivera, Luiz	Hitachi Energy	Member
Dias, Fabricio	GE Vernova	Guest
Dinh, Huan	Hitachi Energy	Member
Door, Jeff	H-J Industries	Guest
Espindola, Marco	Hitachi Energy	Guest
Fong, Sanford	Georgia Power	Guest
Fujimori, Alan	Romgnole	Guest
Gamboa, Jose	H-J Industries	Member
Garza, Gilberto	Prolec	Member
Garza, Hector	Orto	Guest
Gaytan, Carlos	Prolec	Member
Griesacker, Bill	Verizon	Member
Gyore, Attila	Shell USA	Guest
Hayes, Roger	GE Vernova	Guest
Hernandez, Giovanni	Virginia Transformer	Member
Hogg, Ryan	Bureau of Reclamation	Guest
Hopkinson, Phil	Hvolt, Inc	Vice Chair

Full Name	Employer	Participation
Janakiraman, Balaji	Virginia Transformer	Guest
Kennedy, Sheldon	Sheldon P Kennedy Engineer	Member
Labean jr, Bernard	Consumers Energy	Guest
Larison, Andrew	Hitachi Energy	Member
Lee, Moonhee	Hammond Power Solutions	Member
Levin, Aleksandr	Weidmann Group	Member
Lopes, Ricardo	Efacec	Guest
Lopez-Fernandez, Xose	Universidade de Vigo	Member
Maldi, Jinesh	Shell USA	Guest
Mani, Kumar	Duke Energy	Member
Moyolema, Diego	Ecuatran SA	Guest
Munoz, Martin	Orto	Guest
Murcia, Fredy	Siemens Energy	Member
Murillo, Hugo	H-J Industries	Member
Newbill, Mark	Hitachi Energy	Member
Oakes, Stephen	WEG	Member
Orr, Paul	NEMA	Member
Parkinson, Dwight	Eaton	Member
Patel, Vinay	Commonwealth Edison	Member
Rodriguez, Juan Carlos	Magnetron SAS	Member
Schindler, Stefan	Reinhausen	Guest
Schmitt, Wolfgang	Schneider Electric	Guest
Shalley, Meenakshi	Megger	Guest
Shertukde, Hemchandra	University of Hartford	Chair
Simonov, Igor	Toronto Hydro	Guest
Sohail, Mohammad	CES Transformers	Guest
som, sanjib	Pennsylvania Transformer	Guest
Staley, Brad	Leeward Energy	Member
Steineman, Andrew	Delta Star	Guest
Stockton, David	Stockton Consulting	Guest
Szczechowski, Janosz	Reinhausen	Guest
teNyenhuis, Ed	Hitachi Energy	Member
Velasquez, Juan David	Magnetron SAS	Member
Villa, Hector	Ecuatran SA	Member
Wagner, John	AEP	Guest
Walker, David	MGM Transformers	Secretary
Watson, Joe	JD Watson and Associates	Member
Weyandt, Paul	Schneider Electric	Member
White, Joe	Power Engineers	Member
Whitehead, Bill	Reinhausen	Guest
Yuan, Guang	Hitachi Energy	Member

J.9.5 PCS Task Force Continuous Revision to Test Code C57.12.90 **H. Sahin**

Meeting Minutes / Significant Issues / Comments:

Meeting was called to order at 9:30am, October 21, 2025 at Hyatt Regency Coconut Point.

1. Administrative
    a. IEEE Patent Policy and Call for Patents and IEEE SA Copyright Policy
        i. No comments from group
    b. Review of Fall 2025 agenda
        i. No comments from group
    c. Introductions of the attendees
        i. Attendance was taken by QR Code sign-in…no paper attendance sheets were passed out. Due to time constraints, chair did not have each attendee announce their name/affiliation. Name/affiliation was announced as attendees spoke during the meeting.
    d. Updated membership review and count for quorum
        i. 65 members were listed and 45 were counted as present by hand count. Based on the hand count, the chair announced there was QUORUM.
        ii. Attendance list after meeting completed showed 49 members attended.
        iii. **Members are expected to attend and stay in the meeting so business can be conducted. Member requests should be sent to secretary/chair**
    e. Approval Fall 2025 agenda
        i. MOTION-J.John, 2nd-K.Nield
        ii. No opposition to unanimous approval – MOTION APPROVED
    f. Approval of Spring 2025 unapproved minutes
        i. MOTION-H.Flores, 2nd-D.Sauer
        ii. No opposition to unanimous approval – MOTION APPROVED
2. Old Business
    a. Continued discussions on the clause 5.1, "Determination of cold temperature" for resistance measurements. TF agreed for the Chair to work with transformers manufacturers, collect data on different methods, present the analysis to the TF during the next meeting and try to conclude the revision to this clause.
3. New Business
    a. TF reviewed suggestion from Manesh Saraf: The members of C57.12.91 (Test standard for Dry Type Transformers) agreed to add a tolerance on supply voltage for no load loss measurement as below. In order to keep the Dry type and Liquid filled transformers aligned, it will be prudent to have a similar clause added in IEEE C57.12.90 as well.

i. "The average voltage for no-load loss measurement shall be within +/-1% of the rated voltage of the winding".

ii. TF members discussed this suggestion…most members spoke of obtaining data to help implement this suggestion.

iii. MOTION-D.Sauer, 2nd-F.Mills to table this discussion in order to allow companies to obtain data for this suggestion.

1. No Opposition to unanimous approval – MOTION APPROVED

b. Defining a current limit for Load Loss and Impedance test

i. TF will add this item as new business to start discussions at next meeting.

c. Testing the transformers with the liquid which it will operate in the field.

i. TF reviewed this suggestion and consensus was that this item should be moved to another higher up group to be worked on there and then filtered down to other applicable standards.

ii. Will be brought up at Standards Subcommittee in Wed, Oct 22, 2025 meeting.

4. Membership changes
   a. Chair announced that Adam Sewell will no longer be TF Secretary and that Kannan Veeran will take over as TF Secretary starting at the Spring 2026 meeting.
   b. Officers will look at attendance and change TF membership status before next meeting.
5. Next meeting: March 24, 2026 at Spring 2026 Transformers Committee Meeting scheduled for March 22-26, 2026, Fort Worth, TX, USA
6. Close of meeting
   a. Meeting adjourned at 10:45am

Submitted by: Hakan Sahin Date: 11/5/2025

October 21, 2025 Meeting Attendance: **(RM = Request Membership)**

Last Name	First Name	Company (Affiliation)	Role
Adams	Kayland	Prolec-GE Waukesha	MEMBER
An	KyungChan	Hyosung	GUEST
Ansari	Tauhid	Hitachi Energy	MEMBER
Antosz	Stephen	Consultant	MEMBER
Arnold	Elise	SGB-SMIT	MEMBER
Arteaga	Javier	Hitachi Energy	GUEST-RM
Avanoma	Onome	MJC	GUEST-RM
Ayers	Donald	Ayers Transformer Consulting	MEMBER
Bargone	Gilles	FISO	MEMBER
Baumgartner	Christopher	We Energies	MEMBER
Bedoya	Duvier	Hitachi	MEMBER
Bernesjo	Mats	Hitachi	MEMBER
Betancourt	Edwin	Siemens energy	GUEST
Betancourt	Enrique	Prolec ge	GUEST
Boettger	William	Boettger Transformer Consulting LLC	MEMBER
Bolliger	Dominique	HV TECHNOLOGIES, Inc.	MEMBER
Borges	Roberto	Hitachi Energy	GUEST
Botti	Michael	Hyosung HICO	MEMBER
Bradshaw	Garrett	Howard Industries, Inc.	GUEST-RM
Britton	Jeffrey	Doble Engineering	MEMBER
Calitz	David	Siemens Energy	GUEST-RM
Carrizales	Juan Alfredo	Prolec GE	MEMBER
Chan	Vivian	Hitachi	GUEST
Davoudi	Pouneh	Delta Star	GUEST-RM
Dennis	Scott	Hitachi Energy	MEMBER
Diaconu	Dumitru	Delta Star Inc	GUEST-RM
Dillon	Nikolaus	Dominion energy	GUEST-RM
Elson	Eric	San Diego Gas & Electric	GUEST
Ermakov	Evgenii	Hitachi Energy	GUEST
Ersoy	Said	Eaton	GUEST-RM
Espindola	Marco	Hotachi Energy	GUEST
Flores	Hugo	Ermco-ECI	MEMBER
Foldi	Joseph	Foldi & Associates inc	GUEST-RM
Fontana	Franco	Siemens Energy Transformers srl	GUEST
Frazier	Raymond	Ameren	MEMBER
Garcia Paredes	David	Virginia Transformers Corp	GUEST
Garcia	Eduardo	Siemens Energy	GUEST-RM
Gasic	Dragana	Koncar D&ST	GUEST
Girgis	Ramsis	Hitachi	MEMBER
Gorzin	Alireza	Black & Veatch	MEMBER
Gossett	Shawn	Ameren	MEMBER
Gragert	Jeff	Xcel Energy	GUEST
Gray	Taylor	Portland General Electric	GUEST
Gupta	Ravi	Megger	GUEST-RM
Hakim	Shamaun	Pennsylvania Transformer	GUEST
Heinzig	Peter	Weidmann	GUEST
Hernandez Decanini	Giovanni	Virginia Transformer Corp	MEMBER
Hernandez	Sergio	Hammond Power Solutions	GUEST-RM
Herron	William	Reinhausen	GUEST-RM
Hoffman	Saramma	PPL	GUEST
Holifield	Thomas	Howard Industries	GUEST
Hopkinson	Phil	HVOLT Inc.	GUEST-RM
Iman	Mike	MGM Transformers	GUEST-RM
Jaber	Youssef	PECO	GUEST-RM
Janakiraman	Balaji	Virginia transformers corp	GUEST-RM
Jensen	Nick	Delta Star	MEMBER
John	John	Virginia Transformer Corporation	MEMBER
Joshi	Akash	Kimley Horn	GUEST-RM
Kadar	Laszlo	Laszlo & Associates Inc	GUEST
Kennedy	Sheldon	Sheldon P Kennedy Engineering PLLC	GUEST
Khan	Qasim	Georgia Tech- NEETRAC	GUEST
Kim	Dohyung	HD Hyundai electric	GUEST
King	Gary	Independent	GUEST
Kiparizoski	Zan	Howard Industries	GUEST
Kosedagi	Nihat	ERMCO	GUEST-RM
Koshel	Anton	Delta Star Inc	GUEST
Kosmatin	Peter	Kolektor Etra	GUEST
Kowalski	Rafal	Hitachi Energy	GUEST
Kraetge	Alexander	Omicron	GUEST-RM
Kumar	Arvind	Delta star inc	GUEST-RM
Labean	Bernard	Consumers Energy Company	GUEST
Lachman	Mark	Doble	MEMBER
Leach	Jameson	Raytech USA	GUEST

Last Name	First Name	Company (Affiliation)	Role
Leal	Fernando	Prolec Energy	MEMBER
Lee	Moonhee	Hammond Power Solutions	MEMBER
Lochridge	Scott	ERMCO	GUEST
Lopes	Ricardo	Efacec	GUEST
Masoud	Nader	Central Moloney	GUEST
McBride	Jim	JMX High Voltage	GUEST
Mendez	Omar	Prolec	GUEST
Mills	Francis	POWER Engineers	MEMBER
Milojevic	Goran	DV Power	GUEST
Montanha	Juliano	Siemens Energy	GUEST
Moyolema	Diego	Ecuatran SA	GUEST-RM
Murcia	Fredy	Siemens Energy	GUEST
Murray	David	ENERCON	MEMBER
Neild	Kris	Megger	MEMBER
Nims	Joe	Allen & Hoshall	GUEST
Ortiz	Cuauhtemoc	Niagara Power Transformer	MEMBER
Patel	Monil	Pacific Gas and Electric	GUEST-RM
Patel	Sanjay Y.	Royal Smit Transformers	MEMBER
Paul	Mathew	Unimacts Global	GUEST-RM
Pepe	Harry	Doble engineering	MEMBER
Pereira	Luis	TBEA Power Transformers	GUEST
Poulin	Bertrand	Hitachi Energy	GUEST
Radbrandt	Ulf	Hitachi Energy	GUEST
Rapelly	Laxman	Virginia/Georgia Transformer Corporation	GUEST-RM
Rezvan	Arash	Delta Star inc	GUEST
Rodriguez	Juan Carlos	Magnetron	GUEST-RM
Ronchi	Rodrigo	WEG Transformers México	GUEST-RM
Roussell	Marnie	Entergy	GUEST
Sahin	Hakan	Virginia/Georgia Transformer	MEMBER-Chair
Sankarakurup	Dinesh	Duke Energy	GUEST
Sarkar	Amitabh	Virginia Transformer Corporation	GUEST-RM
Sauer	Daniel	Eaton	MEMBER
Schiessl	Markus	SGB	MEMBER
Sewell	Adam	Quality Switch	MEMBER-Secretary
Shaikh	AbdulMajid	Delta star Inc	MEMBER
Shannon	Michael	Rea Magnet Wire	GUEST
Shertukde	Hemchandra	university of Hartford	MEMBER
Shetty	Sanket	Oncor Electric Delivery	GUEST
Shteyh	Ibrahim	Consultant	GUEST-RM
Singh	Amitkumar	Consolidated Edison Company of New York	GUEST-RM
Slattery	Christopher	FirstEnergy	MEMBER
Snyder	Jason	FirstEnergy	GUEST
Som	Sanjib	PTT, LLC	MEMBER
Staya	Mamoon	Hitachi Energy	GUEST
Steele	Hampton	TVA	GUEST
Swarna	Sunny	Virginia Transformer Corp	GUEST-RM
Swiatkowski	Michal	Hitachi Energy	GUEST-RM
Tan	Jonathan	Northern Transformer	GUEST-RM
Tatu	Val	Powersmiths	GUEST-RM
Tekyetim	Can	Hitachi Energy	GUEST
Tellez	Richard	Siemens Energy	GUEST
Templeton	James	Independent	GUEST
Thiede	Andreas	HIGHVOLT Dresden	MEMBER
Thomas	Scott	Hitachi Energy	MEMBER
Varghese	Ajith	Prolec GE Energy	MEMBER
Varnell	Jason	Doble Engineering	MEMBER
Veeran	Kannan	Virginia / Georgia Transformer	GUEST-RM
Verdolin	Rogerio	Verdolin solutions Inc.	GUEST-RM
Villa	Hector	Ecuatran SA	GUEST-RM
Villanueva	Luz	Siemens Energy	GUEST
Vyas	Pragnesh	Center Moloney Inc	MEMBER
Wagner	John	American electric power	GUEST-RM
Wallach	David	Duke Energy	MEMBER
Ward	Nathen	Ermco, Inc.	GUEST
Washburn	Alan	Burns & McDonnell	GUEST
Watson	Joshua	NPPD	GUEST
Weyandt	Paul	Schneider Electric	MEMBER
Wright	Jeffrey	Duquesne Light	GUEST
Yadava	Jayram	Hitachi Energy	GUEST
Yang	Fei	hitachi energy	MEMBER
Zaman	Malia	IEEE SA	GUEST
Zhang	Hongzhi	Hitachi Energy	GUEST-RM
Zibert	Kris	Allgeier Martin	MEMBER

J.9.6 WG HV & EHV Breaker & Transformer Sw. Transients C57.142 **J. McBride**

MEETING MINUTES
IEEE / PES Transformers Committee
Performance Characteristics Subcommittee

WG to Investigate the Interaction between Substation Transients
And Transformers in HV and EHV Applications and Revision of C57.142

Bonita Springs, FL USA
Tuesday, October 21st, 2025
11:00 AM – 12:15 PM
Hyatt Regency – Calusa DE (1)

Chairman – Jim McBride
Vice Chair – Xose Lopez-Fernandez
Secretary – Tom Melle

1) Welcome and Chair's introductory remarks (reminder that the WG paper can be found at https://ieeexplore.ieee.org/document/9161400)
2) Membership attendance poll was taken as well as circulation of Member roster. Quorum was achieved with 37 of 47 Members present. Guest attendance was determined by poll on Microsoft forms. 88 Guests were present for a total of 124 attendees.
3) IEEE Patent Policy Slides – no patent claims
4) Approval of Agenda and Minutes from Last Meeting: Spring 2025 Minutes (motion by Phil Hopkinson / 2nd by Eduardo Garcia Wild) and Fall 2025 Agenda (motion by Jean Carlos Hernandez / 2nd by Phil Hopkinson) unanimously approved.
5) WG PAR extension and Recirculation ballot comments. (Draft 15 R2: Total Comments = 313. Plan to proceed with submitting the final draft document to REVCom with an approval Rate of 97%). All comments have been resolved from the first circulation, with the exception of one editorial comment that was missed. A motion was made by Phil Hopkinson (2nd by Akash Joshi) to retroactively reject the prior missed comment since it was editorial in nature and inform the commentor by email. The motion approved without objection. The Chair thanked the CRG for their outstanding work.
6) Mitigation Methods Task Force Update – Jim McBride / Phil Hopkinson. The Chair highlighted the Mitigation Methods summary (seven main points) and provided the list of Presenters for the tutorial scheduled for Thursday October 23rd at the Bonita Springs TC Meeting.
7) New Business

The WG plans to have ongoing discussions regarding the challenges of high-magnitude, high-frequency transients. It should be noted there are few (if any) factory tests to simulate these occurrences.
During discussion a question from Phil Hopkinson, regarding resolution of the comment from Doug Edwards of the Switchgear Committee was asked: "Should we state the loading levels and chopping currents in the Guide?" The chair responded that this topic will be considered in future business.
Update from IEEE *Switchgear Liaison Task Force* to WG for Revision of C57.142 by David Caverly. The Switchgear Meeting was held at the Wyndham Grand Orlando Resort Bonnet Creek (Orlando, Florida) from April 6 – 11, 2025. No new Task Force work was reported, as all comments are complete. Mr. Caverly mentioned the creation of CIGRE A3.42 (new brochure for transformer failures) that may be of interest to the WG for liaison opportunities.

8) Next Meeting Spring 2026 in Fort Worth, Texas
9) Adjournment (motion by Rogerio Verdolin / 2nd by Phil Hopkinson) at 11:45 AM

ATTENDANCE:

WG Status	Last Name	First Name	Company/Affiliation
CHAIR	McBride	James	JMX High Voltage
SECRETARY	Melle	Thoms	HV-ATS
MEMBER	Boettger	William	Boettger Transformer Consulting LLC
MEMBER	Britton	Jeffrey	Doble Engineering
MEMBER	Espindola	Marco	Hitachi Energy
MEMBER	Frazier	Raymond	Ameren
MEMBER	Garcia	Eduardo	Siemens Energy
MEMBER	Heiden	Kyle	Eaton
MEMBER	Hernandez Decanini	Giovanni	Virginia Transformer Corp
MEMBER	Hernandez-Mejía	Jean Carlos	Georgia Tech NEETRAC
MEMBER	Hoffman	Saramma	PPL
MEMBER	Hopkinson	Philip	HVOLT Inc.
MEMBER	Hossain	Saif	Trench Limited
MEMBER	John	John	Virginia Transformer Corporation
MEMBER	Joshi	Akash	Kimley-Horn
MEMBER	Khan	Qasim	Georgia Tech-NEETRAC
MEMBER	Lee	Moonhee	Hammond Power Solutions
MEMBER	Li	Weijun	Braintree Electric Light Department
MEMBER	Montanha	Juliano	Siemens Energy
MEMBER	Panetta	Sergio	I- Gard Corporation
MEMBER	Parkinson	Dwight	Eaton Corp
MEMBER	Pepe	Harry	Doble Engineering
MEMBER	Plisic	Goran	Koncar Power Transformers Ltd
MEMBER	Pointner	Klaus	Trench Austria GmbH
MEMBER	Poulin	Bertrand	Hitachi Energy
MEMBER	Ronchi	Rodrigo	WEG Transformers México
MEMBER	Roussell	Marnie	Entergy
MEMBER	Sarkar	Amitabh	Virginia Transformer Corporation
MEMBER	Sen	Cihangir	Duke Energy
MEMBER	Sharp	Michael	Trench Limited
MEMBER	Shertukde	Hemchandra	Diagnostic Devices Inc.
MEMBER	Spurlock	Mike	Spurlock Engineering Services
MEMBER	Varghese	Ajith	Prolec GE Waukesha
MEMBER	VERDOLIN	ROGERIO	Verdolin Solutions inc

MEMBER	Yun	Joshua	Virginia Transformer Corp
WG Status	**Last Name**	**First Name**	**Company/Affiliation**
GUEST	Adams	Kayland	Prolec-GE Waukesha
GUEST	Albacete	Karina	Siemens Energy
GUEST	Alexander	Richards	Spearmint Energy
GUEST	Alexander	Richards	Spearmint Energy
GUEST	An	KyungChan	Hyosung
GUEST	Arash	Rezvan	Delta Star Inc.
GUEST	Barker	Sean	HITACHI
GUEST	Betancourt	Edwin	Siemens Energy
GUEST	BOHRN	JOSH	POWER ENGINEERS, INC.
GUEST	Botti	Michael	Hyosung HICO
GUEST	Castro	Juan Carlos	Magnetron
GUEST	Chan	Vivian	Hitachi
GUEST	Cumella	chuck	NWL transformers
GUEST	David	Calitz	Siemens Energy
GUEST	Davoudi	Pouneh	Delta Star
GUEST	Diaconu	Dumitru C	Delta Star Inc
GUEST	Duarte	Fernando	Hitachi Energy
GUEST	Duffy	Jesse	Nashville Electric Service
GUEST	Duvier	Bedoya	Hitachi
GUEST	Elnor	Abdalla	Enercon Services Inc,
GUEST	Elson	Eric	San Diego Gas & Electric
GUEST	Fernandez	Miguel	Braintree Electric Light Dept.
GUEST	Fong	Sanford	Georgia Power
GUEST	Franco	Fontana	Siemens Energy Transformers srl
GUEST	Fujimori	Alan	Romagnole
GUEST	Gagnon	Jean-philippe	Qualitrol
GUEST	Gamboa	Jose	The H-J Family of Companies
GUEST	Gara	Lorne	Shermco
GUEST	Hamoir	Didier	Transformer Protector Corp
GUEST	Harley	John	FirstPower
GUEST	Hollrah	Dere	Burns & McDonnell
GUEST	Hutchins	Neil	Reinhausen Manufacturing
GUEST	Janakiraman	Balaji	Virginia transformers corp
GUEST	Jarosz	Patrycja	IEEE SA
GUEST	Johnson	Christopher	Oncor

GUEST	Juchem	Kevin	Hitachi Energy Germany AG
GUEST	Kim	Yeounsoo	JST power equipment
GUEST	Klempner	Dmitriy	Southern California Edison
GUEST	Kosedagi	Nihat	ERMCO
GUEST	Koshel	Anton	Delta Star Inc
GUEST	Kraetge	Alexander	Omicron
GUEST	Kumar	Arvind	Delta star inc
GUEST	Labean	Bernard	Consumers Energy
GUEST	Leal	Fernando	Prolec GE
GUEST	Lopes	Ricardo	Efacec
GUEST	Luis	Pereira	TBEA Power Transformers
GUEST	Marcos	Czernorucki	Hitachi Energy
GUEST	Mike	Iman	MGM Transformers
GUEST	Milea-Ciobanu	Emil	Delta Star
GUEST	Murray	David	ENERCON
GUEST	Natale	Anthony	HICO America
GUEST	Nuno	Rato	Efacec
GUEST	Patel	Monil	Pacific Gas and Electric
GUEST	Patel	Nitesh	Hyundai Power
GUEST	Paul	Mathew	Unimacts Global
GUEST	Perez	Marcelino	Prolec
GUEST	Ploetner	Christoph	Siemens Energy
GUEST	Radbrandt	Ulf	Hitachi Energy
GUEST	Raymond	Timothy	Inductive Reasoning
GUEST	Rossini	Yuri	Siemens Energy
GUEST	Rutledge	Chris	Gevernova
GUEST	Sanchez Rodriguez	Jesus	Vertiv
GUEST	Sanchez rodriguez	Jesus	Vertiv
GUEST	Schleismann	Eric	Southern Company
GUEST	Sexton	Aron	Kinectrics
GUEST	Shaikh	AbdulMajid	Delta Star Inc
GUEST	Shang	Bryan	ABB
GUEST	Sharma	Devki	Retired
GUEST	Shteyh	Ibrahim	Consultant
GUEST	Singh	Amitkumar	ConEd Company of New York
GUEST	Stacy	Fabian	Hitachi Energy
GUEST	Staya	Mamoon	Hitachi Energy

GUEST	Steele	H. Allen	TVA
GUEST	Steineman	Andrew	Delta Star, Inc.
GUEST	Tekyetim	Can	Hitachi Energy
GUEST	Thiede	Andreas	HIGHVOLT Dresden
GUEST	Topko	Vasily	ZTZ Services Intl.
GUEST	Torchia	Leonard	PSE&G
GUEST	Tostrud	Mark	Dynamic Ratings
GUEST	Van Der Walt	Alwyn	ECI
GUEST	Wagner	John	American electric power
GUEST	Walker	David	MGM Transformers
GUEST	Whitten	Christopher	Reinhausen
GUEST	Xie	Jiahao	S&C Electric Company
GUEST	Yang	Fei	hitachi energy
GUEST	Yang	Fei	Hitachi energy
GUEST	Yuan	Grace	Hitachi Energy
GUEST	Zhang	Hongzhi	Hitachi Energy

J.9.7 WG C57.158 Application Guide for Tertiary and Stabilizing Windings E. Betancourt

PCS Working Group Revision of Application Guide for Tertiary and Stabilizing Windings C57.158

Performance Characteristics Subcommittee
IEEE / PES Transformers Committee

October 21, 2025
Bonita Springs, Florida, US

UNAPPROVED MINUTES

This group met on Tuesday October 21, 2025, at 4:45 PM in Bonita Springs, Florida, US. The attendance record showed **66** people attended the meeting with **17** out of the **35** Members present; a quorum for conducting business was not established. **49** Guests also attended the meeting.

The following **12** Guests requested Membership (to be awarded after consecutive attendance at two WG meetings):

AbdulMajid Shaikh	Delta Star Inc
Alan Fujimori*	Romagnole

Amitkumar Singh	Consolidated Edison Company of New York
Anton Koshel*	Delta Star Inc
Balaji Janakiraman*	Virginia transformers corp
Bill Griesacker*	William Griesacker and Associates
Giovanni Hernandez Decanini	Virginia Transformer Corp
Hongzhi Zhang*	Hitachi Energy
KyungChan An	Hyosung
Libardo Lopez*	Hitachi Energy
Sunny Swarna*	Virginia Transformer Corp
Wilerson Calil*	Hitachi Energy

(*) To become WG Members after this meeting.

The officers were introduced as Enrique Betancourt Chair and Kayland Adams Secretary.

IEEE Patent slides were covered; no issues were brought up.
IEEE Copyright Policy slides were discussed; no issues were brought up.

Attendance was conducted and quorum was not achieved. Agenda was presented and not approved at that time. The Minutes from the last meeting were also presented but not approved. PCS Chair (Sanjib Som) asked for virtual meetings or email approval. The group was informed by IEEE SA (Patrycja) that working group voting could be accomplished over email. In preparation for conducting an e-mail communication process, motion was established to approve the agenda (Amitabh Sarkar, John K. John). There was also a motion to approve the minutes from the last meeting (Eduardo García, Sanjib Som).

1. OLD BUSINESS

A. Status of Straw Ballot for Draft 2:

As agreed in previous (Spring 2025) WG meeting, the Chair prepared and distributed for internal straw-ballot the Draft 2 of the Revised Guide for Application of Tertiary and Stabilizing Windings in Power Transformers. Changes to the original document from 2017 included:

a) Correction of typos and general text improvements.
b) More references provided for special topics.
c) Multiwinding transformers with three Y-connected main windings were introduced, and recommendations provided for the corresponding application of delta-connected stabilizing windings.
d) New Equation 2bis was introduced, to be re-named to Eq. 3 by final edition.
e) The variables and parameters in Figure 5 were explained within the text. In the equivalent circuit, the dot at Xm was removed.

f) In Figure 6, the designation of Phases was changed from “A, B, C” to “1, 2, 3”, for consistency with C57.12.70.
g) Explanation of variables and parameters on Table 1 (Sect. 5.1.3).
h) Table 1 was enhanced with several relevant cases for zero-sequence equivalent circuits. Its variables were explained in the text.
i) Key explanations were added within the title of Figure 10.
j) A more detailed discussion on y-y connected transformers without a delta connected auxiliary winding was added. Reference to recent publications was added (Sect. 5.2).
k) Explanation of the zig-zag connection to reduce zero sequence impedance of a three-phase transformer (Sect. 5.5). Figure 12bis introduced, to be renumbered by final edition.
l) Clause 6 was refreshed with recommendations for collector transformers of renewables sources (wind and solar PV) and battery storage.
m) Figure 13b was introduced to explain axial-split windings.
n) New paragraphs added on grounding of tertiary windings (Sect. 6.7).
o) New section added on Phasor-loading of tertiary windings (Sect. 7.8).
p) New references were added to Sect. 8.1.2 on High Frequency Phenomena.
q) New references added to Sect. 8.3 on “Loading of Transformers Without a Tertiary Winding”.

B. Comments Received to date:

a) E. Morales: Comment on section of document dealing with loading of Y-Y transformers with delta tertiary. Suggestion to clarify when a stabilizing winding can be considered “inactive”.
b) A. Koshel: Several suggestions to expand Table 1.

Both comments will be addressed by the Chair and presented to the WG during the next meeting.

2. Next Steps

Draft 3 is planned to be prepared and approved by Spring 2026 meeting. First ballot would take place in the Fall of 2026. Resolution of first round of comments and draft 4 completed by Spring 2027. If needed, the document would be recirculated and draft 5 completed by Fall 2027 timeframe. PAR expires December 2027.

The Chair asked for volunteers for participation in the comment resolution group., members present were encouraged to contact Chair by email if interested in being part of the comment resolution group.

3. NEW BUSINESS

Sanjay Patel asked Chair to check C57.164 to confirm figures and formulas match between documents. The subject will be discussed in the next WG meeting.
The meeting was adjourned at 5:49 PM.

Respectfully submitted,

Enrique Betancourt Chairman	Dr. Xose Lopez-Fernandez Co-Chair	Kayland Adams Secretary

Next Pages: Attendance List (Req. = Request):

Nr	Last Name	First Name	Affiliation	Status
1	Adams	Kayland	Prolec GE Waukesha	Member
2	Betancourt	Enrique	Prolec GE	Member
3	An	KyungChan	Hyosung	Req Membership
4	Bertran	Tiago	Siemens Energy, Inc.	Guest
5	Boettger	William	Boettger Transformer Consulting LLC	Member
6	Britton	Jeffrey	Doble Engineering	Guest
7	Calil	Wilerson	Hitachi Energy	Req Membership
8	Calitz	David	Siemens Energy	Guest
9	Czernorucki	Marcos	Hitachi Energy	Guest
10	De la Garza	Mario	Hyundai Power Transformers	Guest
11	Duffy	Jesse	Nashville Electric Service	Guest
12	Eduardo	Garcia	Siemens Energy	Member
13	Fujimori	Alan	Romagnole	Req Membership
14	Gagnon	Jean-philippe	qualitrol	Guest
15	Giraldo	Orlando	THE H-J FAMILY OF COMPANIES	Member
16	Goyal	Varun	Hydro One	Guest
17	Griesacker	Bill	William Griesacker and Associates	Req Membership
18	Gupta	Sachin	Pennsylvania Transformer Technology LLC	Guest
19	Hakim	Shamaun	Pennsylvania Transformer	Guest
20	Hayes	Roger	GE Vernova	Guest
21	Hernandez Decanini	Giovanni	Virginia Transformer Corp	Req Membership
22	Hollrah	Derek	Burns & McDonnell	Guest
23	Janakiraman	Balaji	Virginia transformers corp	Req Membership
24	Jarosz	Patrycja	IEEE SA	Guest
25	John	John	Virginia Transformer Corporation	Member
26	Kirchner	Fred	HICO America	Guest
27	Koshel	Anton	Delta Star Inc	Req Membership
28	Lopez	Libardo	Hitachi Energy	Req Membership
29	Martinez	Daniel	Jfe canada	Guest

30	Martinez Mares	Alberto	WEG TRANSFORMERS	Guest
31	Mendez	Omar	Prolec	Guest
32	Montoya	Francisco	Siemens Energy	Guest
33	Murcia	Fredy	Siemens Energy	Guest
34	Nambi	Shankar	Bechtel Infrastructure	Member
35	Natale	Anthony	HICO America	Guest
36	Nolte	Mike	Kiewit	Guest
37	Park	Jaeyoung	Iljin Electric	Guest
38	Patel	Nitesh	Hyundai Power	Member
39	Patel	Sanjay Y.	Royal Smit Transformers	Member
40	Pepe	Harry	Doble Engineering	Guest
41	Perez	Marcelino	Prolec	Guest
42	Ronchi	Rodrigo	WEG Transformers México	Member
43	Roussell	Marnie	Entergy	Member
44	Sarkar	Amitabh	Virginia Transformer Corporation	Member
45	Schiessl	Markus	SGB	Member
46	Seungmo	Kim	Hyosung HICO	Guest
47	Shaikh	AbdulMajid	Delta Star Inc	Req Membership
48	Sharma	Devki	Retired	Guest
49	Singh	Amitkumar	Consolidated Edison Company of New York	Req Membership
50	Skoff	Nicholas	Dominion Energy	Guest
51	Snyder	Jason	FirstEnergy	Member
52	Solano	William	Voltyx	Guest
53	Som	Sanjib	PTT, LLC	Member
54	Song	Seoyun	Hyosung HICO	Guest
55	Speegle	Andy	Entergy	Member
56	Staley	Braf	Leeward Renewable Energy	Guest
57	Steineman	Andrew	Delta Star, Inc,	Guest
58	Swarna	Sunny	Virginia Transformer Corp	Req Membership
59	Tellez	Richard	Siemens Energy	Guest
60	Thomas	Scott	Hitachi Energy	Guest
61	Walmsley	Jonathan	GE Vernova	Guest
62	Webb	Bruce	Knoxville Utilities Board	Guest
63	Wright	Chris	Industry	Guest
64	xingshuang	Du	Sieyuan	Guest

65	Yang	Fei	hitachi energy	Member
66	Zhang	Hongzhi	Hitachi Energy	Req Membership

J.9.8 WG PC57.32 Neutral Grounding Devices **S. Kennedy**

ANSI/IEEE PC57.32
IEEE Neutral Grounding Devices

1. **Working Group Meeting**
2.

Hyatt Regency
Bonita Springs, FL, USA

3. **Tuesday, Oct 21, 2025**
4. **4:45 PM – 6:00 PM**
5.
6. **Chair – Sheldon Kennedy**
7. **Vice Chair – Thomas Melle**
   Secretary – Ed teNyenhuis
8.
9.
10. **Welcome and Chair's Remarks**

11. **Circulation of Attendance Sheets**

(Quorum achieved – 16 of 21 Members; 24 Guests present). Two guests requested membership which were accepted.

12.
13. **Approval of Agenda**

(Motion to approve by Sergio Panetta, second by Juan Carlos Cruz Valdes – motion passed without objection)

14. **Patent Call -** none

15. **Copyright and IEEE Ethics Policies**

16. **Approval of Minutes from previous Meeting**

(Motion to approve by David Caverly second by Don Ayers – motion passed without objection)

17. **Reviewed straw ballot comments.**

There were 45 comments received with 18 being technical. Technical comments had been sent to the Task Force Chairs of the devices: Neutral Grounding Reactors, Neutral Grounding Transformers, Neutral Grounding Resistors, Neutral Ground Fault Neutralizers and Combination Devices.

During review, there was a motion by Sergio Panetta, second by Don Ayers, to revise 6.4.2.2 description of x/r to “is the ratio of ohms reactance to ohms resistance in the system when the ground fault occurs”. This motion was passed without objection.

The working group reviewed and resolved all straw ballot comments.

The draft will be updated with all the agreed changes.

18.

19. Working Group Draft

A motion was made by Ryan Hogg, second by Kurt Kaineder, to request permission from PCS to submit the updated draft with the agreed changes to begin the ballot process. The motion was approved by the working with greater than 75% (16 votes for, 0 votes negative, 0 votes abstain).

20. Old Business

None

21. New Business

None

22. Next in-person meeting – Spring 2026 Meeting (IEEE TC – Fort Worth, Texas, USA – March 22-26, 2026)

23. Adjournment at 6.10PM local time

List of Attending Members and Guests

Last Name	First Name	Affiliation	Status
Kennedy	Sheldon	Sheldon P. Kennedy Engineering	Chair
Melle	Thomas	HIGHVOLT	Vice-Chair
teNyenhuis	Ed	Hitachi Energy	Secretary
Dinh	Huan	Hitachi Energy	Member
Hossain	Saif	Trench Ltd.	Member
Kaineder	Kurt	Trench Austria	Member
Sharp	Mike	Trench Ltd.	Member
Ayers	Donald	Ayers Consulting	Member
Bhardwaj	Naveen	Trench Group	Member
Bolar	Sankey	ONCOR	Member
Cruz Valdes	Juan Carlos	Prolec GE	Member
David	Caverly	Trench	Member
Hogg	Ryan	Bureau of Reclamation	Member
Panetta	Sergio	I-Gard Corp.	Member
Pointner	Klaus	Trench Austria	Member
Radbrandt	Ulf	Hitachi Energy	Member
Allison	Robert	Dominion Energy	Guest
Beaudain	Jason	Wiedmann	Guest
Gardner	James	Prolec GE	Guest
Gragert	Jeff	Xcel Energy	Guest
Guinard	Benjamin	Power Magnetics	Guest
Keels	Thomas	KEElectric Engineering PLLC	Guest
Klemper	Dmitriy	SCE	Guest
Pedro	Pedro	Efacec	Guest
Propts	Thomas	Dominion Energy	Guest
Rato	Nuno	Efacec	Guest
Tanaka	Troy	Burns & McDonnell	Guest
Wagner	John	AEP	Guest
Lopes	Ricardo Castro	Efacec	Guest
Silva	Andre	GE Verona	Guest
Shteyh	Ibrahim	Consultant	Guest
Hopkinson	Phil	Hvolt	Guest
Jones	Braxton	SD Myers	Guest
Schmitt	Wolfgang	Schneider Electric	Guest
Mayer	Robert	Trench	Guest

Sinclair	Jim	Black & Veatch	Guest
Blake	Robert	Niagara Power Transformers	Guest
Alwaca	Seetaram	Kiewit	Guest
Paul	Matthew		Guest
Debass	Sami	Epri	Guest

J.9.9 TF Transformer Data Required for System Studies **J. Watson**

Performance Characteristics Subcommittee Task Force Meeting Minutes
Transformer Data Required for System Studies
Monday, October 20, 2025 at 09:30:00 am EST
Location: Sanibel, Hyatt Regency Coconut Point, Springs, FL

Chair: Joe Watson
Vice Chair: Rogerio Verdolin
Secretary: Alwyn Vanderwalt

Roll call was held through counting members present in the meeting based on the roster. The meeting did not initially reach a quorum, but a quorum was eventually reached after some other members were asked to join the meeting. There were 18 members present with a total membership of 34. A paper roster was circulated to record attendance.

The Chair welcomed everyone and stated that the purpose of the meeting was to review the report that was put together by the TF to submit to the Performance Characteristics Subcommittee. The chair informed the TF that the the document had been approved by a quorum of the TF members following an email vote in the weeks prior to the Fall 2025 meeting. The purpose of the review was to give the members one last chance to review and suggest modifications to the document before submitting it to the SC. The recommendation of the TF, as captured in the report, was that a guide is needed.

Discussion:
A recommendation was made to limit the scope of a guide to power transformers and possibly submit it to the Power Transformers SC for action. After lengthy discussion and input from several members it was agreed to keep the recommendations related to the scope of the guide open ended and to submit it to the Performance Characteristics SC where it may be usable to a wider audience than just the power transformers community. The detail scope of the guide will be decided by the PAR Study group.

A motion was made by Steve Shull to submit the TF report to the PCSC with the recommendation to form a PAR Study group with the intent of architects a guide to address the need identified by the TF.
The motion was seconded by Hemchandra Shertukde.
The motion carried unanimously and the TF report will be shared at the PCS meeting.
The TF thereby concluded its activities and will not meet again.

The meeting closed at 10:?? am EST.

Meeting minutes compiled by:
Alwyn VanderWalt
TF Secretary

List of attendees: (Captured on paper roster – some members did not sign the roster before leaving the meeting)

TF - Transformer Data Required for System Studies

First Name	Last Name	Affiliation	Status	**Fall 2025 Meeting**
Meysam	Ahmadi	Ametek	Member	
Nabi	Almeida	Prolec GE	Member	
Mats	Bernesjo	Hitachi Energy	Guest	**x**
Enrique	Betancourt	Prolec GE	Guest	
Vivian	Chan	Hitachi Energy	Guest	**x**
Bhaumik	Choksi	Hitachi Energy	Guest	
Olivia	Cordova	Bureau of Reclamation	Guest	
Mike	Craven	Qualus Power Services	Guest	
Janet	Crockett	Fayetteville PWC	Member	
Rich	Cryer	Digitalgrid	Guest	
Luiz	de Oliveira	Hitachi Energy	Guest	
Ali	Dehkordi	Ametek	Member	
Gabriel	Delgado	Invenergy	Guest	
Zamora Gabriel	Delgado	Invenergy	Guest	
Fernando	Duarte	EPRI	Guest	**X**
Roger	Dugan	EPRI (Retired)	Guest	
Evgenii	Ermakov	Hitachi Energy	Guest	
Ken	Fedor	SGB-Smit	Guest	

Patrick	Foster	NextEra	Guest	
Lorne	Gara	Shermco Industries	Guest	
Carlos	Gaytan	Prolec GE	Member	
Ramsis	Girgis	Hitachi Energy	Member	x
John	Hipchen	Copper Development Assn.	Guest	
Miljenko	Hruac	Hitachi Energy	Guest	
Zinan	Huang	Sieyum Toshiba	Guest	
Donghyun	Jang	LS Electric	Guest	
Sukin	Jang	Iljin Energy	Guest	
Rohitha	Jayasinghe	Manitoba Hydro	Guest	
Basim	Khan	NEETRAC - Georgia Tech.	Guest	
Heun su	Kim	LS Electric	Guest	
Egon	Kirchenmayer	Siemens Energy	Member	
Evan	Knapp	Eaton	Guest	
Nihat	Kosedagi	Hitachi Energy	Member	
Anton	Koshel	Delta Star, Inc.	Guest	X
Ashwini	Labh	Hitachi Energy	Member	X
Andrew	Larison	Hitachi Energy	Guest	
Weijun	Liang	Braintree Electric Light Dept.	Guest	X
Yuefeng	Liang	Ametek	Member	
Ricardo	Lopes	EFACEC	Member	
Libardo	Lopez	Hitachi Energy	Guest	
Xose	Lopez-Fernandez	University of Vigo	Member	
Lee	Matthews	Howard Industries	Guest	
Omar	Mendez	Prolec GE	Guest	X
Tim	Menter	Lincoln Electric System	Member	
Juliano	Montanha	Siemens Energy	Member	x
Alejandro	Montenegro	S & C	Member	
Curtis	Moore	Digitalgrid	Guest	
Tyler	Morgan	Duke Energy	Guest	
Dan	Mulkey	Mulkey Engineering Inc.	Guest	
Jerry	Murphy	Retired - RCES	Member	x

Shankar	Nambi	Bechtel Energy, Inc.	Member	
Joe yong	Park	LS Electric	Guest	
Nitesh	Patel	Hyundai Power Transformers	Guest	
Verena	Pellon	NextEra/FPL	Guest	
Goran	Plisic	Siemens Energy KPT	Member	X
Homer	Portillo	Advanced Power Technology	Guest	
Bertrand	Poulin	Hitachi Energy	Guest	
Ulf	Radbrandt	Hitachi Energy	Member	X
Marnie	Roussell	Entergy	Member	x
Dan	Sauer	Eaton	Guest	X
Eric	Schleismann	Southern Company	Guest	
Nambi	Shankar	Bechtel		
Hemchandra	Shertukde	University of Hartford/DDI	Member	X
Stephen	Shull	BBC Electric Services Inc.	Member	X
Sanjib	Som	Pennsylvania Transformer Tech	Guest	
Hampton	Steele	TVA	Guest	
Andy	Steineman	Delta Star	Member	x
Maxathe	Swapnil	Megger	Member	
Janusz	Szczechowski	Machenfabrik Reinhausen	Guest	
Mike	Thibault	Pacific Gas and Electric	Guest	
Michael	Thompson	IEEE	Member	
Fran	Topol	Koncar Power Transformers	Guest	
Oliver	Uhlmann	Reinhausen Canada	Guest	
Reinaldo	Valentin	Duke Energy	Guest	
Alwyn	Vanderwalt	ECI	Secretary	x
Rogerio	Verdolin	Verdolin Solutions	Vice-Chair	x
Dharam	Vix	Prolec GE	Member	
Josh	Wagner	AEP	Guest	X
Alan	Washburn	Burns and McConnell	Member	x
Joe	Watson	JD Watson and Associates, Inc.	Chair	x
Joshua	Watson	Nebraska Public Power District	Member	X
Bruce	Webb	KUB	Guest	

Trenton	Williams	Advanced Power Technologies	Guest	
Jiahao	Xie	S&C Electric Company	Member	x
Fei	Yang	Hitachi Energy	Guest	X
Joseph	Youn	Iljin Energy	Guest	
Zachary	Yu	Sieyuan Toshiba	Guest	
Hongzhi	Zhang	Hitachi Energy	Member	
Zhixsang	Zhu	Chint	Guest	

J.9.10 WG Entity Winding Deformation Guide PC57.141 **X. Shao**

From Lumin Zhao: I can confirmed the IEEE PC57.141 WG had approved the e-motion for the PAR extension on 15th Oct., 2025 (please review attachment 1-3 for details), and the PAR extension request also had been submitted to Nescom. So we request Chair Sanjib Som to take a vote at PCS to approve the PAR extension at the upcoming in-person Transformers meeting.

J.9.11 C57.120 – Loss Evaluation Guide **R. Verdolin**

Performance Characteristics Subcommittee Working Group Meeting Minutes
Guide for Loss Evaluation of Distribution and Power Transformers and Reactors
Monday, October 20, 2025 at 03:15 pm EST
Location: Hyatt Regency Coconut Point, Bonita Springs, FL

Chair: Rogerio Verdolin
Vice Chair: Kris Zibert
Secretary: Mike Nolte

This was the first meeting of the working group so all those in attendance who requested membership are included as WG members. Attendance was recorded electronically using a QR code.

The Chair welcomed everyone and stated that as the first meeting of the working group, Wallace Binder (prior member of the original working group) would give a presentation of the background of the guide. Following the presentation by Mr. Binder, the draft document (C57.120/D1) was presented so that task forces could be established for reviewing and updating the individual sections.

Background Presentation:
Wallace Binder provided a background presentation, noting that he was an original Working Group member in 1991. He discussed competing evaluation methods, including EEI, REC (RUS), and IEEE, and

emphasized the focus on formulas specifically for power transformers. He explained that the distribution transformer standard (C57.12.33) was never published; however, its latest revision served as the initial draft for the 2017 version of the C57.120 standard. Wallace also highlighted the DOE's efforts on transformer efficiency standards and stated that the goal of the C57.120 standard is to ensure consistency and clear term definitions. He noted that DOE and EU standards have shifted attention toward transmission-class transformers and referenced the Energy Information Administration's Annual Energy Outlook. Wallace concluded by posing a question to the group: "How many users rely on EU or DOE efficiency standards to price transformers versus performing their own evaluation using methods in C57.120 or the EEI loss evaluation technique?"

Discussion:
The draft document was briefly reviewed and the Chair called for volunteers to assist with reviews and updates to individual sections. Proposed updates would be presented at the Spring 2026 meeting in Fort Worth, TX.

The following TF leads were assigned:

- Overview – Kris Zibert
- Definitions, Acronyms, Abbreviations – Kris Zibert
- Loss Evaluation Parameters – Mike Nolte
- Loss Evaluation – Wallace Binder
- Annex A – Rogerio Verdolin
- Annex B – Rogerio Verdolin

It was noted that the PAR was set to expire 12/31/2029 to help inform the timeline for document revisions and balloting.

The meeting closed at 3:55 pm EST.

Meeting minutes compiled by:
Mike Nolte
WG Secretary

List of attendees: 14 members, 23 guests (Captured on electronically in the meeting via QR code)

First Name	**Last Name**	**Affiliation**	**Status**
Rashid	Adnan	Measurement Canada	Guest
Edwin	Betancourt	Siemens energy	Guest
Naveen	Bhardwaj	Trench Group	Guest

Wallace	Binder	WBBinder Consultant	Member
JOSH	BOHRN	POWER ENGINEERS, INC.	Guest
Juan Alfredo	Carrizales	Prolec GE	Guest
David	Caverly	Trench Limited	Member
xingshuang	Du	Sieyuan	Guest
Fadi	Fayad	Automation Systems & Diagnostics	Member
Mladen	Hanzek	Koncar D&ST	Guest
Kurt	Kaineder	Trench Austria	Member
Sheldon	Kennedy	Sheldon P Kennedy Engineering PLLC	Guest
Dmitriy	Klempner	Southern California Edison	Guest
Nihat	Kosedagi	ERMCO	Member
Geraldo	Magela Júnior	Siemens-Energy	Guest
Omar	Mendez	Prolec	Guest
Mike	Nolte	Kiewit	Secretary
Mike	Obrien	Trillum US	Guest
Luis	Pereira	TBEA Power Transformers	Guest
Marcelino	Perez	Prolec GE	Guest
Miguel	Plascencia	Pacific Gas and Electric	Member
Ion	Radu	Hitachi Energy	Member
Marnie	Roussell	Entergy	Member
Ben	Samutthananont	Measurement Canada	Guest
Wolfgang	Schmitt	Schneider Electric	Guest
Nicholas	Skoff	Dominion Energy	Guest
Jason	Snyder	FirstEnergy	Member
Sunny	Swarna	Virginia Transformer Corp	Member
Andreas	Thiede	HIGHVOLT Dresden	Guest
Eduardo	TOLCACHIR	TTE transformers	Guest
ROGERIO	VERDOLIN	Verdolin Solutions	Chair
Luz	Villanueva	Siemens Energy	Guest
John	Wagner	American electric power	Guest
Jonathan	Walmsley	GE Vernova	Guest

Chris	Wright	Industry	Guest
Jayram	Yadava	Hitachi Energy	Member
Kris	Zibert	Allgeir, Martin & Associates, Inc.	Vice Chair

J.9.12 TF – Xfmrs for Wind Turbine Application IEC/IEEE 60076-16 S. Debass

Purpose: Discussion on the continuation, revision, and coordination of the dual-logo IEEE/IEC document on transformers for wind-turbine applications.

Total Attendance: 73
Membership Request: 28
Guest: 41
Unspecified: 4

Chair: Samson Debass
Co-Chair: Thomas Keels
Secretary: Sudip Chanda

Discussion Summary

1. Dual-Logo Document Status and Expiration

- The current IEEE/IEC dual-logo document covering wind-turbine transformers is approaching its end of life.
- IEEE standards have a **10-year validity**, after which revision or withdrawal is required.
- IEC's **stability date** was originally **2026** and was later proposed to be extended to **2030**.
- The team noted that **IEC continuation depends on IEEE action**; IEC cannot maintain dual-logo status if IEEE allows the standard to expire

2. Coordination with IEC

- Discussion highlighted that IEC and IEEE must **align scope and title** to maintain the dual-logo relationship.
- Both organizations participate "every step of the way, every vote, every draft."
- The IEC process includes a **separate ballot** (one country, one vote) and operates on a different timeline from IEEE.
- There was uncertainty about the **current IEC interest level** in continuing the joint work; members planned to verify this in the upcoming IEC meetings

3. Scope Clarification

- The group confirmed that the scope **excludes collector transformers**, as they do not experience the same vibration conditions as transformers located **inside the nacelle, tower, or base** of individual wind turbines.
- The standard intends to cover transformers that connect the **turbine to the collector system**, not the large collector transformers themselves.
- Participants discussed ensuring this clarification remains in the wording to prevent confusion

4. Voltage Class Considerations

- A member noted that in regions such as Germany, turbine transformers now reach **132 kV and even 150 kV**, especially for offshore applications.
- Expanding the voltage class range may require **manufacturer feedback** and IEC alignment to update the document's scope.
- Discussion also noted that different countries (China, Asia, South America) must be considered since IEC is global in representation

5. Revision Pathway

- The process described:
    1. A **Task Force** defines a **title and scope**.
    2. This proposal is submitted to the **IEEE PAR or SA Board**.
    3. Once approved, a **Working Group (WG)** is formed to handle the revision.
- For dual-logo standards, the **scope must be created jointly** with IEC before proceeding with the PAR.
- Members acknowledged that IEEE and IEC must "talk to each other" to create a matching scope

6. Partial Discharge (PD) Limits

- PD performance for wind-farm transformers was discussed.
- It was noted that PD limits and voltage levels should be reviewed when revising the document

7. Motion to Proceed

- The **motion** was made by **Thomas Prevost** (TOM), and it was 2nd by **Casey Kennedy** to proceed with preparing the PAR and begin scope development for the dual-logo revision.
- The motion was **seconded and accepted by the group**.
- Members agreed to move forward with the intent to develop a coordinated scope jointly with IEC

8. Usage Inquiry

- A brief survey asked participants how many currently use the document; responses indicated **primary use in drive applications**

Key Decisions

1. **Consensus reached** to move forward with revising the dual-logo wind-turbine transformer standard.
2. **Motion approved** to proceed with forming a working group after scope alignment with IEC.
3. **Agreement** that the revised scope must continue to exclude collector transformers.

4. **Action planned** to verify IEC's interest and confirm stability-date details.
5. **Acknowledgment** of potential voltage-class expansion (132–150 kV) subject to global manufacturer input.

Follow-Up / Next Steps

- **Task Force** to coordinate with IEC counterparts to confirm shared title, scope, and revision interest.
- **PAR preparation** to begin after IEC alignment.
- **Working Group formation** pending PAR approval.
- **Manufacturer feedback collection** on voltage classes and offshore applications.
- **Review of PD limits** in relation to wind-farm transformer design.

No	Last Name	First Name	Member	Guest	Request membership
1.	Avanoma	Onome			
2.	Ayala	Alejandro	No	Yes	No
3.	Ayers	Donald E.			Yes
4.	Ballard	Casey	No	Yes	Maybe
5.	Brooks	Jeffrey	No	Yes	No
6.	Chanda	Sudip	No	Yes	Yes
7.	Chrysler	Rhett	No	Yes	
8.	Espindola	Marco	No	Yes	No
9.	Fontana	Franco		Yes	
10.	Frye	Curtis	No	Yes	
11.	Gasic	Dragana	No	Yes	No
12.	Gaytan	Carlos	No	Yes	Yes
13.	Giraldo	Orlando	N	Yes	Yes
14.	Gupta	Sachin			Yes
15.	Gupta	Sachin			Yes
16.	Gyore	Attila	No	Yes	Yes
17.	Hamoir	Didier	No	Yes	No
18.	Hernandez Decanini	Giovanni			Yes
19.	Jacob	Nathan	No	Yes	No
20.	Jakob	Karl	No	Yes	
21.	John	John	Yes		Yes
22.	Keels	Thomas	Yes	Yes	Yes
23.	Kennedy	Sheldon		Yes	
24.	kim	dal ho	No	Yes	No
25.	Klein	Kenneth	No	Yes	No

26.	Larison	Andrew	No	Yes	No
27.	Levin	Aleksandr			Yes
28.	Locarno	Mario	Yes		Yes
29.	Mai	Tim-Felix	Yes		Yes
30.	Mantoan	Francis	No	Yes	No
31.	Milea-Ciobanu	Emil	No	Yes	No
32.	Montoya	Francisco	No	Yes	
33.	Moyolema	Diego	No	Yes	No
34.	Murcia	Fredy	No	Yes	No
35.	Park	Jaeyoung	No	Yes	No
36.	Park	Jaeyoung	No	Yes	No
37.	Parkinson	Dwight			Yes
38.	Prevost	Thomas		Yes	No
39.	Rodriguez	Juan Carlos	No	Yes	Yes
40.	Salem	Sherif			Yes please
41.	Sanchez	David	No	Yes	Yes
42.	Schindler	Stefan	No	Yes	No
43.	Schmitt	Wolfgang	No	Yes	No
44.	Schwartz	Daniel	No	Yes	No
45.	Schweiger	Ewald		guest	
46.	Som	Sanjib			Yes
47.	Stank	Markus	No	Yes	Yes
48.	Stankes	David		Yes	
49.	Stretch	Kerwin			Yes
50.	Sturtevant	Christian		Yes	
51.	Tedesco	Joseph	No	Yes	Yes
52.	Tirado	Fernando			Yes
53.	TOLCACHIR	Eduardo		Yes	No
54.	Tostrud	Mark		Guest	
55.	Urbinez	Orlando	No	Yes	No
56.	Wagner	John	No	Yes	No
57.	Weiss	Zachery	Yes		Yes
58.	Werelius	Peter	No	Yes	No
59.	Whitehead	William	No	Yes	Yes
60.	Yang	Fei		Yes	Yes
61.	Yang	Fei		Yes	Yes
62.	Zhang	Hongzhi		Yes	Yes

J.9.13 TF C57.109 Through Fault Current Duration **S. Hoffman**

Task Force PAR Study Group Meeting for IEEE C57.109

1. Bonita Springs, Florida, USA Meeting – October 21, 2025 8:00-9:15 am EST

Chair: Saramma Hoffman
Vice Chair: Jason Varnell

2. The meeting was called to order at 8:00 AM EST. Ms. Saramma Hoffman (PP&L) presided as chair and Mr. Jason Varnell (Doble Engineering) presided as vice-chair and acting secretary since the secretary position was vacant at the start of the meeting.
3. This was the first task force meeting for the PAR study group.
4. There were sixty-six (66) active participants present. Forty (40) participants requested membership.
5. The chair reviewed the IEEE patent slides and the group made no patent claims.
6. The chair reviewed the copyright policy with the group.
7. The chair reviewed the title, scope and purpose from the previous publication. The chair also reviewed the general content of the guide and application of the guide.
8. The chair opened the floor for discussion to assess if the task force had interest in revising the guide. There was unanimous consensus by the task force to seek revision to the guide noting the following major discussion items that were brought forward by the task force:
    a. The task force would like to revise the guide to include the history and background of the curves presently used in the guide. The task force would like engineering justification for the curves to be included in the next revision.
    b. The task force would like mathematical expressions/functions to define the curves instead of figures only.
    c. There was discussion on whether there are impacts from reverse power flow on how the curves should be used and if modifications are necessary. It was expressed that the working group can assess the document for consideration of this item.
    d. There was discussion on whether there should be special considerations for three-winding transformers on how the curves should be used and if modifications are necessary. It was expressed that the working group can assess the document for consideration of this item.
    e. There was discussion that the bibliography should be reviewed for any necessary updates.
9. The task force reviewed the title, scope and purpose and recommended no changes.
10. Akash Joshi (Kimley Horn) made a motion to accept the previous publication's title, scope and purpose as the title, scope and purpose for a new PAR for IEEE C57.109. The motion also called for the chair of the task force to seek subcommittee approval at the upcoming subcommittee meeting to request a PAR. The motion was seconded by Sanjib Som (PTTI). The motion passed with unanimous consent. The approved title, scope and purpose are as follows:
    a. **Title**: IEEE Guide for Liquid-Immersed Transformers Through-Fault Current Duration

b. **Scope**: This guide applies to transformers referenced in IEEE Std C57.12.00 as Categories I, II, III, and IV. It sets forth recommendations essential for the application of overcurrent protective devices applied to limit the exposure time of transformers to short-circuit currents (see IEEE Std C37.91) This guide is not intended to imply overload capability.
c. **Purpose**: Protective devices such as relays and fuses have well-defined operating characteristics that relate fault magnitude to operating time. These characteristic curves should be coordinated with a comparable curve(s) applicable to transformers that relate duration and fault magnitude to withstand capability.

11. The chair requested a volunteer for the role of secretary. Akash Joshi (Kimley Horn) requested to be secretary and was granted by the chair.
12. The task force will plan to meet as a working group meeting will be in Fort Worth, TX, USA during the Spring 2026 Transformers Committee Meeting pending approval from the subcommittee.
13. The meeting adjourned at 9:00 AM EST.

Attendance Record (Membership Status After F25 TF Meeting):

First Name	Last Name	Affiliation	Membership
Kayland	Adams	Prolec-GE Waukesha	Member
Javier	Arteaga	Hitachi Energy	Member
Onome	Avanoma	MJC	Member
Barry	Beaster	HJ Family of Companies	Guest
Tiago	Bertran	Siemens Energy, Inc.	Guest
Enrique	Betancourt	Prolec ge	Member
William	Boettger	Boettger Transformer Consulting LLC	Member
Juan Alfredo	Carrizales	Prolec GE	Member
Juan	Castro	Magnetron	Guest
Vivian	Chan	Hitachi	Member
Huan	Dinh	Hitachi Energy USA	Guest
Will	Elliott	AEP SWEPCO	Guest
Franco	Fontana	Siemens Energy Transformers srl	Guest
Alan	Fujimori	Romagnole	Member
Jean-philippe	Gagnon	Qualitrol	Guest
Jose	Gamboa	The H-J Family of Companies	Member
David	Garcia Paredes	Virginia Transformers Corp	Member
Orlando	Giraldo	THE H-J FAMILY OF COMPANIES	Member
Alireza	Gorzin	Black & Veatch	Member
Shamaun	Hakim	Pennsylvania Transformers	Guest
Didier	Hamoir	Transformer Protector Corp	Guest
Giovanni	Hernandez Decanini	Virginia Transformer Corp	Member
Jean Carlos	Hernandez-Mejia	Georgia NEETRAC	Guest
Saramma	Hoffman	PPL	Member
Ryan	Hogg	Bureau of Reclamation	Member
Derek	Hollrah	Burns & McDonnell	Guest
Balaji	Janakiraman	Virginia transformers corp	Member
John	John	Virginia Transformer Corporation	Member
Christopher	Johnson	Oncor	Guest
Akash	Joshi	Kimley Horn	Member
Sheldon	Kennedy	Sheldon P Kennedy Engineering PLLC	Guest

Arvind	Kumar	Delta star inc	Member
Ricardo	Lopes	Efacec	Guest
Robert	Mayer	Trench Austria	Member
Emil	Milea-Ciobanu	Delta Star	Member
Philip	Miller	Memphis Light, Gas & Water	Member
Shankar	Nambi	Bechtel Infrastructure	Member
Anthony	Natale	HICO America	Guest
Mike	Nolte	Kiewit	Member
Daniel	Obregón	Company	Guest
Poorvi	Patel	Hitachi Energy	Member
Nitesh	Patel	Hyundai Power	Member
Mathew	Paul	Life member	Guest
Pedro	Pedro	Efacec Energia	Member
Nuno	Rato	Efacec Transformers	Guest
Timothy	Raymond	Inductive Reasoning	Member
Chris	Rutledge	Gevernova	Member
Sherif	Salem	Eversource energy	Member
Sanjib	Som	PTT, LLC	Member
Brad	Staley	Leeward Renewable Energy	Member
Andrew	Steineman	Delta Star, Inc.	Guest
Janusz	Szczechowski	Maschinenfabrik Reinhausen GmbH	Member
Scott	Thomas	Hitachi Energy	Guest
Mark	Tostrud	Dynamic Ratings	Guest
Leonard	Torchia	PSE&G	Member
Jason	Varnell	Doble Engineering	Member
John	Wagner	American electric power	Member
David	Wallach	Duke Energy	Member
Alan	Washburn	Burns & McDonnell	Guest
Matthew	Webb	GE Vernova	Member
Zachery	Weiss	WEG transformers USA	Guest
Drew	Welton	Intellirent	Member
Stefan	Wirth	Coil Innovation GmbH	Guest
Chris	Wright	Industry	Guest
Jiahao	Xie	S&C electric	Member
Jayram	Yadava	Hitachi Energy	Guest

J.9.14 TF C57.110 Xfmr Capability when Supplying Non-sinusoidal Load Currents S. Narawane

Task Force for IEEE C57.110

Unapproved Meeting Minutes

Fall 2025 Meeting
Hyatt Regency Coconut Point
Blue Heron Meeting Room
Bonita Springs, FL

3:15 PM EST, Tuesday, October 21, 2025

Chair: Aniruddha Narawane
Vice-Chair: Sasha Levin
Secretary: Joseph Tedesco

This was the first meeting of the IEEE C57.110 PAR Study Group Task Force. The meeting was held in the Blue Heron Meeting Room and Aniruddha Narawane called the meeting to order at 3:16 PM.

Quick introductions were made. The copyright, behavior, and patent slides were shown.

There were 23 people present in the meeting. With this being the first meeting of the task force, there were no quorum requirements, and anyone who wanted to be a member could request membership.

Aniruddha N. reviewed the current title. There was much discussion about the capability of transformers under harmonic load, the effects on losses, the harmonic loss factor, and the impacts of harmonic loading on thermal effects. There was also some discussion about whether to discuss both current and voltage in the title. Ultimately, the first motion was made.
Motion 1: Accept the original title.
Moved by: Kayland Adamas
Seconded by: Laszlo Kadar
Sasha Levin offered a friendly amendment to change the motion, but Kayland A, rejected the amendment. The vote was 7 in favor, 4 against, with 3 abstentions, and the motion carried.

The title will be “IEEE Recommended Practice for Establishing Liquid Immersed and Dry-Type Distribution Transformer Capability When Supplying Non-sinusoidal Load Currents.”

Aniruddha N. reviewed the current scope. There was some discussion about whether to include three-winding transformers and transformers for the solar industry. There was also some discussion about whether to expand the scope to cover transformers in other standards, such as C57.17, and whether to remove mention of rectifiers. There were a few motions pertaining to the scope.

Motion 2: Remove the explicit exclusion of the rectifiers from the scope.
Moved by: Sasha L.
Seconded by: Zach Weiss
The vote was unanimous, and the motion carried.

Motion 3: Accept the scope as shown on the screen.
Moved by: Sasha L.
Seconded by: Val Tatu
Prior to the vote being taken, Colby Lovins pointed out that NEMA ST20, which is one of the standards referenced in the scope, discusses rectifiers and does not exclude them. C57.12.00 and C57.12.01 do exclude rectifiers, and he proposed that this difference would be the reason why rectifiers were explicitly excluded. There was some discussion about adding the rectifier exclusion back into the scope, but Aniruddha N. pointed out that we already had a motion on the table, and Sasha L. refused to withdraw his motion, so we had to take a vote.
The vote was 5 in favor, 9 against, with 2 abstentions, so the motion did not pass.

Motion 4: Add the explicit rectifier exclusion back to the scope.
Moved by: Colby L.
Seconded by: Zach W.
There was no discussion.
The vote was 13 in favor, 0 opposed, with 4 abstentions. The motion carried.

Motion 5: Remove the footnotes from the scope.
Moved by: Dave Stankes
Seconded by: Zach W.
There were some discussions about why the footnotes were there and how they would cause confusion during the process of SA voting on the PAR.
The vote was 15 in favor, 0 opposed, with 2 abstentions. The motion carried.

The scope will be, “This recommended practice applies only to two winding transformers covered by IEEE Std C57.12.00, IEEE Std C57.12.01, and NEMA ST20. It does not apply to rectifier transformers.”

There were no changes proposed to the purpose. The purpose will be, “The purpose of this document is to establish uniform methods for determining the capability of transformers when supplying nonsinusoidal load currents of known characteristics.”

Aniruddha N. asked for a motion to submit the PAR.
Motion 5: Submit the title, scope, and purpose for the PAR.
Moved by: Laszlo K.
Seconded by: Zach W.
There was no discussion. The vote was unanimous, and the motion carried.

Aniruddha N. would submit the PAR, and he expected that we would meet as a working group in March 2026 at the meeting in Fort Worth, TX. The meeting was adjourned at 4:27 PM.

ATTENDANCE

Role	**First Name**	**Last Name**	**Affiliation**
Guest	Kayland	Adams	Prolec-GE Waukesha
Guest	Sam	Attaguile	3M Company
Guest	Patel	Dipeshkumar	Hyper Solutions
Guest	Sanford	Fong	Georgia Power
Guest	Curtis	Frye	3M
Guest	Renjie	Fu	ERMCO
Guest	Jose	Gamboa	The H-J Family of Companies
Guest	Gilberto	Garza	Prolec GE
Guest	Laszlo	Kadar	Laszlo & Associates Inc
Vice Chair	Aleksandr	Levin	Weidmann
Guest	Colby	Lovins	Federal Pacific
Guest	Ken	McKinney	UL Solutions
Guest	Mohsen	Mostafaei	Eaton Corporation
Chair	Aniruddha	Narawane	Voltaris Power
Guest	Sanjib	Som	Pennsylvania Transformer
Guest	David	Stankes	3M
Guest	Erik	Tarango	Olsun Electric
Guest	Val	Tatu	Powersmiths
Secretary	Joseph	Tedesco	Hitachi Energy

Guest	John	Wagner	American Electric Power
Guest	Joshua	Watson	NPPD
Guest	Zachery	Weiss	WEG Transformers USA
Guest	Malia	Zaman	IEEE SA

J.10 Performance Characteristics Subcommittee Attendance List

Status	First Name	Last Name	Affiliation
Chair	Sanjib	Som	Pennsylvania Transformer
Vice-Chair	Kris	Zibert	Allgeier, Martin and Associates
Secretary	John	Wagner	American electric power
Member	Kayland	Adams	Prolec-GE
Member	Tauhid Haque	Ansari	Hitachi Energy
Member	Stephen	Antosz	Stephen Antosz & Associates, Inc
Member	Elise	Arnold	SGB
Member	Javier	Arteaga	Hitachi Energy
Member	Alex	Ayala	Power Partners
Member	Donald	Ayers	Ayers Transformer Consulting
Member	Robert	Ballard	DuPont
Member	Gilles	Bargone	FISO Technologies Inc.
Member	Christopher	Baumgartner	We Energies
Member	Enrique	Betancourt	Prolec GE
Member	Wallace	Binder	WBBinder Consultant
Member	William	Boettger	Boettger Transformer Consulting LLC
Member	Jeffrey	Britton	Phenix Technologies, Inc./Doble Eng.
Member	Juan Alfredo	Carrizales	Prolec GE
Member	Craig	Colopy	Retired - EATON Corporation
Member	Juan Carlos	Cruz Valdes	Prolec GE
Member	Samson	Debass	EPRI
Member	J. Arturo	Del Rio	Siemens Energy
Member	Reto	Fausch	RF Solutions
Member	Hugo	Flores	Hitachi Energy
Member	Raymond	Frazier	Ameren
Member	Eduardo	Garcia Wild	Siemens Energy

Member	Rob	Ghosh	General Electric
Member	Ramsis	Girgis	Hitachi Energy
Member	Bill	Griesacker	Duquesne Light Co.
Member	Sergio	Hernandez Cano	Hammond Power Solutions
Member	Jean	Hernandez-Myia	Georgia Tech
Member	Saramma	Hoffman	PPL Electric Utilities
Member	Philip	Hopkinson	HVOLT Inc.
Member	Saif	Hossain	Trench Limited
Member	Nicholas	Jensen	Delta Star Inc.
Member	John	John	Virginia Transformer Corp.
Member	Christopher	Johnson	Oncor Electric Delivery
Member	Akash	Joshi	Mott MacDonald
Member	Jerzy	Kazmierczak	Hitachi Energy
Member	Sheldon	Kennedy	Sheldon P. Kennedy Engineering, PLLC
Member	Fernando	Leal	
Member	Moonhee	Lee	Hammond Power Solutions
Member	Aleksandr	Levin	Weidmann Electrical Technology
Member	Weijun	Li	Braintree Electric Light Dept.
Member	Jose Luis	Machain	Prolec GE-Waukesha
Member	Tim-Felix	Mai	Siemens Energy
Member	Alberto	Martinez	WEG Transformers USA Inc.
Member	James	McBride	JMX Services, Inc.
Member	Thomas	Melle	HIGHVOLT
Member	Francis	Mills	Power Engineers
Member	Hugo	Murillo	H-J Family of Companies
Member	David	Murray	Tennessee Valley Authority
Member	Ryan	Musgrove	Oklahoma Gas & Electric
Member	Kristopher	Neild	Megger
Member	Poorvi	Patel	Hitachi Energy
Member	Harry	Pepe	Phenix Technologies, Inc.
Member	Klaus	Pointner	Trench Austria GmbH
Member	Ion	Radu	Hitachi Energy
Member	Rodrigo	Ronchi	WEG-Voltran
Member	Marnie	Roussell	Entergy
Member	Hakan	Sahin	Virginia/Georgia Transformer

Member	Amitabh	Sarkar	Virginia Transformer Corp.
Member	Daniel	Sauer	EATON Corporation
Member	Markus	Schiessl	SGB
Member	Abdul Majid	Shaikh	Delta Star, Inc.
Member	Michael	Sharp	Trench Limited
Member	Christopher	Slattery	FirstEnergy Corp.
Member	Jason	Snyder	First Energy
Member	Steven	Snyder	Hitachi Energy
Member	Charles	Sweetser	OMICRON electronics Corp USA
Member	Ed	teNyenhuis	Hitachi Energy
Member	Ajith	Varghese	Prolec GE-Waukesha
Member	Jason	Varnell	Doble Engineering Co.
Member	Rogerio	Verdolin	Verdolin Solutions Inc.
Member	Richard	vonGemmingen	Dominion Energy
Member	Pragnesh	Vyas	CMI
Member	David	Wallach	Duke Energy
Member	Bruce	Webb	Knoxville Utilities Board
Member	Drew	Welton	Intellirent
Member	Jeffrey	Wright	Duquesne Light Co.
Member	Fei	Yang	Hitachi Energy
Member	Joshua	Yun	Virginia Transformer Corp.
Guest	Edwin	Betancourt	Siemens-Energy
Guest	Michael	Botti	Hyosung HICO
Guest	David	Caverly	Trench Limited
Guest	Sudip	Chanda	Delta Star Inc.
Guest	Michael	Craven	Qualus Power Services
Guest	Janet	Crockett	Fayetteville PWC
Guest	Pouneh	Davoudi	Delta Star Inc.
Guest	Scott	Dennis	Hitachi Energy
Guest	Dumitru	Diaconu	Delta Star Inc.
Guest	Eric	Elson	SDGE
Guest	Miguel	Fernandez	Braintree Electric Light Dept.
Guest	Shawn	Gossett	Ameren
Guest	Taylor	Gray	Portland General Electric (PGE)
Guest	Brad	Greaves	Weidmann

Guest	Benjamin	Guinand	Power Magnetics Inc.
Guest	Peter	Heinzig	Weidmann Electrical Technology
Guest	Ryan	Hogg	Bureau of Reclamation
Guest	Laszlo	Kadar	Hatch
Guest	Kurt	Kaineder	Trench Group
Guest	Yeounsoo	Kim	
Guest	Gary	King	Howard Industries
Guest	Nihot	Kosedagi	Hatachi Energy
Guest	Anton	Koshel	Delta Star Inc.
Guest	Alexander	Kraetge	OMICRON electronics Deutschland GmbH
Guest	Arvind	Kumar	Delta Star Inc.
Guest	Bernard	LaBean, Jr.	Consumers Energy
Guest	Andrew	Larison	Hitachi Energy
Guest	Ricardo	Lopes	Efacec
Guest	Libardo	Lopez	Hitachi Energy
Guest	Colby	Lovins	Federal Pacific
Guest	Omar	Mendez	Prolec-GE
Guest	Juliano	Montanha	Siemens Energy
Guest	Shankar	Nambi	Bechtel
Guest	Marcelino	Perez	Prolec
Guest	Bertrand	Poulin	Hitachi Energy
Guest	Thomas	Prevogt	Weidmamn
Guest	Thomas	Propts	Dominion Energy
Guest	Arash	Rezvan	
Guest	Juan	Rodriguez	Magnetron
Guest	Fernando	Salinas	
Guest	Garret	SarKinen	Xcel Energy
Guest	Eric	Schleismann	Southern Company
Guest	Devki	Sharma	Entergy
Guest	Stephen	Shull	BBC Electrical Services, Inc.
Guest	Ami tkumar	Singh	Conedison
Guest	Brad	Staley	Leenard Renewable Energy
Guest	Hampton	Steele	Tennessee Valley Authority
Guest	Andrew	Steineman	Delta Star Inc.
Guest	Janusz	Szczechowski	Maschinenfabrik Reinhausen

Guest	Jonathan	Tan	Northern Transformer
Guest	Valeriu	Tatu	Powersmiths
Guest	Andreas	Thiede	Highvolt Dresden
Guest	Scott	Thomas	Hitachi Energy
Guest	Fernando	Tirado	Prolec Energy
Guest	Leonard	Torchia	PSE&G
Guest	Olivier	Uhlmann	Reinhausen Canada Inc.
Guest	Alwyn	Van Der Walt	Electrical Consultants, Inc.
Guest	Hector	Villa	Ecuatran SA
Guest	Alan	Washburn	Burns & McDonnell
Guest	Joshua	Watson	Nebraska Public Power District
Guest	Jiahao	Xie	S&C Electric Company
Guest	Malia	Zaman	IEEE
Guest	KyungChan	An	Hyosung
Guest	Orlando	Benitez	Hyosung HICO
Guest	John	Beuke	WEG
Guest	Naveen	Bhardwaj	Trench Group
Guest	Fabián camilo	Cala gonzalez	Siemens Energy
Guest	Juan	Castellanos	Prolec GE
Guest	Adriana	Cisco Sullberg	Salt River Project
Guest	Fabricio	Dias	GE Vernova
Guest	xingshuang	Du	Sieyuan
Guest	Said	Ersoy	Eaton
Guest	Sanford	Fong	Georgia Power
Guest	Alan	Fujimori	Romagnole
Guest	Jean-philippe	Gagnon	qualitrol
Guest	James	Gardner	Prolec-ge Waukesha
Guest	Steven	Hegerle	Howard Industries
Guest	Thomas	Holifield	Howard Industries
Guest	Derek	Hollrah	Burns & McDonnell
Guest	Youssef	Jaber	PECO
Guest	Geraldo	Junior	Siemens-Energy
Guest	Thomas A.	Keels	kEElectric Engineering PLLC
Guest	Dohyung	Kim	HD Hyundai electric
Guest	Ashwini	Labh	Hitachi Energy

Guest	Emil	Milea-Ciobanu	Delta Star
Guest	Mohsen	Mostafaei	Eaton Corporation
Guest	Diego	Moyolema	Ecuatran SA
Guest	Mike	Nolte	Kiewit
Guest	Cuauhtemoc	Ortiz	Niagara Power Transformer
Guest	Luis	Pereira	TBEA power transformers
Guest	Henry	Pinto	Island Associates, Inc.
Guest	Alexander	Richards	Spearmint Energy
Guest	David	Sanchez	NextEra Energy
Guest	Surinder	Sandhu	TBEA USA Corp
Guest	Sanket	Shetty	Oncor Electric Delivery
Guest	Manpreet	Singh	Constellation Energy
Guest	Nicholas	Skoff	Dominion Energy
Guest	Seoyun	Song	Hyosung HICO
Guest	Mamoon	Staya	Hitachi Energy
Guest	Dave	Stelmach	IntelliRent
Guest	Can	Tekyetim	Hitachi Energy
Guest	Luz	Villanueva	Siemens Energy
Guest	Richard	von Gemmingen	Dominion Energy
Guest	Chris	Wright	Industry
Guest	Zhenquan	yu	Sieyuan Toshiba transformer company