Distribution Transformer Subcommittee
Working Group Minutes

Document #: PC57.12.34

Document Title: Requirements for Pad-Mounted, Compartmental Type, Self-Cooled, Three Phase Distribution Transformers, 10 MVA and Smaller; High Voltage, 34.5 Nominal System Voltage and Smaller; Low Voltage,15kV Nominal System Voltage and Below

Chair: Steve Shull **Vice-Chair** Nader Masoud

Secretary Nader Masoud **Percent Complete**

Current Draft Being Worked On: **Dated:**

Meeting Date: March 24, 2024 **Time:** 3:15 – 4:30

Attendance:

A sign-up sheet was circulated with total of 93 in attendance including 40 Members and 53 Guests of which 8 requested Membership.

First Name	Last Name	Company	Role
Alejandro	Ayala	Power Partners	Member
Jared	Bates	Oncor Electric Delivery	Member
Thomas	Callsen	Weldy-Lamont Associates	Member
Noah	Chesser	Oncor Electric Delivery	Member
Thomas	Dauzat	AEP-SWEPCO	Member
Carlos	Gaytan	Prolec GE	Member
Kenneth	Hampton	Baltimore Gas & Electric	Member
Gary	King	Consultant	Member
Gilbert	Kozer	Northeast Transformer Services, LLC	Member
Patrick	Kozer	Northeast Transformer Services, LLC	Member
Alejandro	Macias	Centerpoint Energy	Member
Nicholas	Manske	Oncor Electric Delivery	Member
Lee	Mathews	Howard Industries	Member
Michael	Morgan	Duke Energy	Member
Ion	Radu	Hitachi Energy	Member
Martin	Rave	IFD Technologies	Member
Robert	Reepe	Georgia Power Co.	Member
Mason	Rush	Central Moloney	Member
Jaber	Shalabi	VanTran Industries, Inc.	Member
Michael	Shannon	Rea Magnet Wire	Member

First Name	Last Name	Company	Role
James	Spaulding	Fort Collins Utilities	Member
Michael	Thibault	Pacific Gas & Electric	Member
Jeremy	Van Horn	IFD Technologies Inc.	Member
John	Vartanian	National Grid	Member
Pragnesh	Vyas	Cleveland Cliffs	Member
Zachary	Weiss	WEG Transformers USA Inc.	Member
Michael	Zarnowski	Carte International	Member
Rehan	Ali	Siemens Energy	Member
Jeffrey	Brooks	Asplundh Engineering Services	Member
Jose	Gamboa	H-J Family of Companies	Member
Giovanni	Hernandez	Virginia Transformer Corp.	Member
Ramadan	Issack	American Electric Power	Member
Brian	Klaponski	Carte International	Member
Weijun	Li	Braintree Electric Light Dept.	Member
Parry	Lively	Tempel	Member
Jerry	Murphy	Chen Moore and Associates	Member
Dwight	Parkinson	EATON Corporation	Member
Reinaldo	Valentin	Duke Energy	Member
Bruce	Webb	Knoxville Utilities Board	Member
Joshua	Yun	Virginia Transformer Corp.	Member

Distribution Transformer Subcommittee
Working Group Report

First Name	Last Name	Company	Role
Jerry	Allen	Metglas, Inc.	Guest
Kevin	Biggie	Weidmann Electrical Technology	Guest
Brian	Connelghton	Cleveland-Cliffs	Guest
Janet	Crockett	Fayetteville PWC	Guest
Hector	Garza	Orto de Mexico	Guest
Luke	Grandbois	IFD Technologies	Guest
Kendrick	Hamilton	ERMCO	Guest
Thomas	Holifield	Howard Industries	Guest
Patrycja	Jarosz	IEEE SA	Guest
Braxton	Jones	SD Meyers	Guest
Adam	Klaponski	Carte International Inc.	Guest
Fredy	Murcia	Siemens Energy	Guest
Stephen	Oakes	WEG Transformers USA Inc	Guest
Joel	Pacas	IFD Technologies	Guest
Stefano	Schindler	Reinhausen	Guest
Alan	Traut	Howard Industries	Guest
Joshua	Verdell	ERMCO	Guest
Allen	Hsiao	Shihlin Electric	Guest
Rebecca	Kim	Cheryong Electric	Guest
Kang-Jtw	Lee	Cheryong Electric	Guest
Antonio	Robles	Bureau of Reclamation	Guest
Luya	Peuc	Koncar Dist.	Guest
Mathew	Greenhaw	OG&E	Guest
Stanley	Yeh	Shihlin Electric	Guest
Gilberto	Garza	Prolec GE	Guest
Scott	Beck	Trantech Radiator Products	Guest
Hector	Villa	Ecuatran SA	Guest

First Name	Last Name	Company	Role
Stephen	Walbach	Alabama Power	Guest
Nicholas	Koinis	Centerpoint Energy	Guest
Nihat	Kosedagi	ERMCO	Guest
Nabi	Almeida	Prolec GE	Guest
John	Crotty	Ameren	Guest
Fernando	Duarte	Hitachi	Guest
Kyle	Heiden	EATON Corporation	Guest
Justin	Minikel	EATON Corporation	Guest
Hugo	Murillo	H-J Family of Companies	Guest
Nicholas	Post	WEC Energy Group	Guest
Jospeh	Schumack	Ameren	Guest
Mohammed	Sohail	Trench Limited	Guest
Tim	Tillery	Howard Industries	Guest
David	Walker	MGM Transformer Co.	Guest
Shelby	Walters	Howard Industries	Guest
Alan	Fujimori	Romagnole	Guest
Juan	Rodriguez	Magnetron	Guest
Yeounsoo	Kim	JST Power Equipment	Guest
Fernando	Tirado	Prolec GE	Guest
Jiahao	Xie	S&C Electric	Guest
Ben	Hershberger	Midwest Transformer	Guest
Rich	Cryer	Digitalgrid inc.	Guest
Curtis	Moore	Digitalgrid inc.	Guest
Chris	Brown	SDGE	Guest
Fidel	Castro	SDGE	Guest
Prudhvi	Bhattiprolu	AES	Guest

Distribution Transformer Subcommittee
Working Group Report

Meeting Minutes:

The Chair called the meeting to order at 3:15 P.M. MST on March 24, 2024. Attendees verbally identified themselves by name and affiliation.

1. IEEE Privacy Policy
   The Chair verbally stated and explained in detail all the information according to IEEE Privacy Policy.
2. New Members
   The Chair announced and recognized the newest members to the Working Group. The Chair also explained the process of becoming a member and retaining membership status.
3. Meeting Quorum
   The Chair displayed the members of the WG and a quorum was established.
4. Agenda Approval
   The Chair displayed the agenda for this meeting. A motion was made by Tom Dauzat and seconded by Jerry Murphy to "Approve the Agenda as shown". The Chair asked for any opposition to the displayed Agenda to which no opposition was observed. The Agenda was approved as shown.
5. Minutes Adjustment
   Prior to approval of the minutes for the previous WG session in St. Louis MO, the Chair advised there was some confusion as to the intent of the motion for approving the changes proposed by Task Force 4 regarding article 7.2 and the value of the induced test voltage. The WG Chair explained, as affirmed by the Task Force Chair, that while the WG had approved to move forward with a revision to the induced voltage rating to 2X rated voltage in lieu of 3.46X rated + 1000V, the WG had also decided to delay any wording changes until the task force had an opportunity to review the rest of the document to ensure nothing had been missed or duplicated. Considering this, the WG Chair recommended revision of the previous session's minutes by striking the last sentence of the Fall 2024 minutes as shown in the attached revised minutes.

   A motion to approve the amended minutes was made by Carlos Gaytan and seconded by Martin Rave. The Chair asked for any discussion and there was none. There was no opposition to the proposed modification.

6. Minutes Approval
   Upon approval of the motion to amend the previous minutes, a motion was made by Carlos Gaytan and seconded by Martin Rave to "approve the Last Meeting Minutes as modified". The Chair asked if there was any opposition to approving the amended minutes to which no opposition was observed. These amended Minutes were approved.
7. Confirmation of IEEE SA Essential Patent Statement
   The patent information request was displayed. The chair provided an opportunity for participants to identify patent claim(s)/patent application claim(s) and/or if a participant is personally aware of patent claim(s)/patent application claim(s) that may be essential for the use of this standard. There were no responses to this request so no patent claim(s)/patent application claim(s) were identified.
8. IEEE SA Copyright Policy Statement and Participant Behavior Policy were shown without any discussion or objection.
9. Old Business
   a. Three Phase Transformer Standards Comparison – Test Sections

      Alan Traut reviewed the information of the past and present three phase standards as they pertain to the required induce voltage testing level. Alan Traut shared the following observations:

- C57.12.26-1992: Specified that “Transformer primary is designed for solidly-grounded application”
- C57.12.34-2004: Eliminated text clarifying that the voltage was a line to ground voltage. Deleted the sentences “which will develop from the high voltage line terminal to ground” from the 1992 version, and “In no case, however, shall the line-to-ground voltage developed exceed…”
- C57.12.34-2009: Replaced “high-voltage winding”, with “winding with a voltage greater than 600 V”. Added text of exemption of chopped wave test
- C57.12.34-2015: No major changes other than update references to other Stds.
- C57.12.34-2022: No major changes other than update references to other Stds.

He pointed out that only the C57.12.34 standard required the 3.46X rated +1000V voltage level for induced voltage testing, whereas all other three phase standards relied on a 2X rated voltage level.

b. C57.12.34 Induced Voltage Testing discussion

Michael Zarnowski, TF#4 Chair, revisiting the induced voltage test level of 3.46X rated + 1000V and how such a level exceeds phase-to-phase internal clearances, coil-to-coil insulation and switch ratings. He noted that the WG discussed the current wording of clauses 7.1, 7.2 and 7.3. They recommended that 7.2 be rewritten. They recommended that 7.3 be retained because this was done with the understanding that standard C57.12.34 is intended for transformers designed for distribution and not power.

Carlos Gaytan presented an alternative proposal to clause 7.2 based on the observation that the TF#4 proposed revision of changing the induced voltage test level to 2X rated would not be applicable to units where the neutral was internally grounded, and that in such cases, a special induced voltage test level would be required that induces a line-to-ground voltage in the HV winding close to the specified value of the applied voltage test. The alternative proposal presented by Carlos was discussed at length, covering the use of either three-phase or single-phase sources to apply the test voltage, applicability of test voltage levels to graded insulation in the case of grounded WYE-WYE transformers, and the feasibility of always being able to remove the neutral ground connection. His presentation is included in the appendix of these minutes

After continued discussion, a motion to approve the TF#4 proposed wording for clause 7.2. was made by Michael Zarnowski and seconded by Jerry Murphy.

- *7.2 Dielectric tests*

  For wye-wye connected transformers with a high voltage winding neutral terminal with interconnected or internally grounded neutrals, no applied voltage test is required on a winding greater than 600 V.
  When high- or low-voltage terminations are used that fall under IEEE Std 386, they may not be suitable for chopped wave testing; therefore, when terminations that conform to IEEE Std 386 are used (bushing wells, 600 A integral bushings, etc.) chopped wave tests are not required.

The Chair asked for any discussion on the proposed change and, upon no further discussion, initiated a vote to approve the motion. The motion carried with the following results:

- Those in favor: 28
- Those opposed: 2
- Abstentions: 5

10. New Business

    TF4 pointed out a discrepancy between the wording of clause 8.7.4.1 titled "Neutral Terminal – 600V and Below" and Figures 2 and 6 which have an option for an H0. The Chair displayed the proposed wording by TF#4 to address the discrepancy.

    8.7.4.1 Neutral terminal—600 V and below
    The neutral terminal shall be either a blade connected directly to the tank or a fully insulated terminal. If a fully insulated terminal is used, a ground pad shall be provided on the outer surface of the tank. One or more removable ground straps suitably sized for the short-circuit rating of the transformer as defined in IEEE Std C57.12.00-2021 shall be provided and connected between the neutral terminal and the ground pad. For wye-wye connected units where~~,~~ the high-voltage and low voltage neutral are ~~shall be~~ connected ~~to the low-voltage neutral~~ together internally, there shall be ~~with~~ provisions for opening this connection for testing.

    A motion to approve the TF4 proposed wording for clause 7.2. was made by Michael Zarnowski and seconded by Gary King. The Chair asked for any discussion on the proposed change and upon no further discussion, initiated a vote to approve the motion. The motion carried with the following results:

    - Those in favor: 27
    - Those opposed: 1
    - Abstentions: 8

11. After concluding new business, the Chair advised the new draft of the standard will be published for careful review by members, with a vote to go to Ballot in the upcoming Fall meeting.

12. The meeting adjourned at 4:30 P.M. MST.

Submitted by: Nader Masoud

Date: March 25, 2025.

Meeting minutes item #9a – Standards and associated clauses reviewed by Al Traut:

IEEE C57.12.26-1992

6.2 Dielectric Test

For wye-wye connected units, the transformer primary is designed for solidly-grounded application, and no applied-potential test is required. The induced-potential test shall be performed by applying, between the terminals of each winding, a voltage of 1000 V plus 3.46 times rated transformer winding voltage, which will develop from the high-voltage line terminal to ground. In no case, however, shall the line-to-ground voltage developed exceed 40 000 V for 125 kV BIL or 50 000 V for 150 kV BIL. For this test, the neutral terminal shall be grounded. However, under conditions in which the neutral terminal ground connection can be removed, both the applied potential test and the induced potential test, as specified in IEEE C57.12.00-1987 [3], may be performed.

IEEE C57.12.34-2004

8.2 Dielectric tests

For wye-wye connected transformers, no applied voltage test is required on the high-voltage winding. An induced voltage test shall be performed as specified in IEEE Std C57.12.90. The voltage induced between the high-voltage line terminals and ground shall be the lower of the following values:

a) 3.46 times the rated high-voltage winding voltage plus 1000 volts, or

b) The applied voltage test values provided in IEEE Std C57.12.00, Table 5.

IEEE C57.12.34-2009

7.2 Dielectric tests

For wye-wye connected transformers, no applied voltage test is required on a winding greater than 600 V. An induced voltage test shall be performed as specified in IEEE Std C57.12.90. The voltage induced between the line terminals of a winding with a voltage greater than 600 V and the ground shall be the lower of the following values:

a) 3.46 times the rated winding voltage plus 1000 V

b) The applied voltage test values provided in Table 5 of IEEE Std C57.12.00-2006.

When high- or low-voltage terminations are used that fall under IEEE Std 386-2006, they may not be suitable for chopped wave testing; therefore, when terminations that conform to IEEE Std 386-2006 are used (bushing wells, 600 A integral bushings, etc.), chopped wave tests are not required.

IEEE C57.12.34-2015

7.2 Dielectric tests

For wye-wye connected transformers, no applied voltage test is required on a winding greater than 600 V. An induced voltage test shall be performed as specified in IEEE Std C57.12.90. The voltage induced between the line terminals of a winding with a voltage greater than 600 V and ground shall be the lower of the following values:

a) 3.46 times the rated winding voltage plus 1000 V, or

b) The applied voltage test values provided in IEEE Std C57.12.00-2010, Table 4.

When high- or low-voltage terminations are used that fall under IEEE Std 386, they may not be suitable for chopped wave testing; therefore, when terminations that conform to IEEE Std 386 are used (bushing wells, 600 A integral bushings, etc.) chopped wave tests are not required.

IEEE C57.12.34-2022

7.2 Dielectric tests

For wye-wye connected transformers, no applied voltage test is required on a winding greater than 600 V. An induced voltage test shall be performed as specified in IEEE Std C57.12.90. The voltage induced between the line terminals of a winding with a voltage greater than 600 V and ground shall be the lower of the following values:

a) 3.46 times the rated winding voltage plus 1000 V

b) The applied voltage test values provided in Table 3 of IEEE Std C57.12.00-2021

When high- or low-voltage terminations are used that fall under IEEE Std 386, they may not be suitable for chopped wave testing; therefore, when terminations that conform to IEEE Std 386 are used (bushing wells, 600 A integral bushings, etc.) chopped wave tests are not required.

IEEE C57.12.20-2023 Overhead Transformers

6. Tests

6.1 General

Except as specified in 6.2, tests shall be performed as specified in IEEE Std C57.12.00 and in IEEE Std C57.12.90.

6.2 Dielectric tests

For single-phase transformers with a high-voltage BIL of 150 kV or less that have one high-voltage bushing and a high-voltage terminal permanently connected to ground, no applied-voltage test is required. Induced-voltage tests shall be performed by applying between the terminals of one winding a voltage that shall be developed from the high-voltage line terminals to ground. This voltage shall be 1000 V plus 3.46 times the rated transformer winding voltage, but in no case shall the line-to-ground voltage developed exceed 40 000 V for 125 kV BIL or 50 000 V for 150 kV BIL. For this test, the neutral terminal shall be grounded. An applied voltage test shall be applied on the low-voltage winding.

IEEE C57.12.24-2023 3-Phase Submersible Transformers

6. Tests

6.1 General

All tests shall be performed in accordance with IEEE Std C57.12.00 and IEEE Std C57.12.90.

IEEE C57.12.36-2017 Distribution Substation Transformers

4.7 Routine tests

Routine tests shall be made in accordance with IEEE Std C57.12.00 for distribution transformers and IEEE Std C57.12.90TM.

IEEE C57.12.40-2017 3-Phase Network Transformers

4. Tests

All tests shall be performed in accordance with IEEE Std C57.12.00 and IEEE Std C57.12.90. The dielectric test levels shall be in accordance with distribution transformer levels in IEEE Std C57.12.00. When bushings and bushing wells are used for the primary entrance to the transformer, chopped wave tests are not required.

IEEE C57.12.10-2017 Power Transformers

4.7 Design, routine, and other tests

All required or specified design, routine, and other tests shall be made in accordance with IEEE Std C57.12.00 unless otherwise specified by the user.

Meeting minutes item #9b – Carlos Gaytan's presentation:

Proposal for Section 7.2 Dielectric Tests Induced Voltage Test for Wye-Wye Connected Transformers

IEEE/PES Transformers Committee

WG C57.12.34- Spring 2025

Carlos Gaytan

Background

IEEE C57.12.26-1992

6.2 Dielectric Test

For wye-wye connected units, the transformer primary is designed for solidly-grounded application, and no applied-potential test is required. The induced-potential test shall be performed by applying, between the terminals of each winding, a voltage of 1000 V plus 3.46 times rated transformer winding voltage, which will develop from the high-voltage line terminal to ground. In no case, however, shall the line-to-ground voltage developed exceed 40 000 V for 125 kV BIL or 50 000 V for 150 kV BIL. For this test, the neutral terminal shall be grounded. However, under conditions in which the neutral terminal ground connection can be removed, both the applied potential test and the induced potential test, as specified in IEEE C57.12.00-1987 [3], may be performed.

IEEE C57.12.34-2004

8.2 Dielectric tests

For wye-wye connected transformers, no applied voltage test is required on the high-voltage winding. An induced voltage test shall be performed as specified in IEEE Std C57.12.90. The voltage induced between the high-voltage line terminals and ground shall be the lower of the following values:

a) 3.46 times the rated high-voltage winding voltage plus 1000 volts, or

b) The applied voltage test values provided in IEEE Std C57.12.00, Table 5.

1 year production data from one Manufacturer on Wye-Wye Three phase padmounted transformers

Wye-Wye Three phase padmounted transformers	% of units
Neutral conn. to X0H0 Bushing (ext. ground strap)	87%
Neutral conn. to H0 Bushing (ext. ground strap)	7%
Neutral internally grounded	6%
Total	100%

- Over 90% of the wye-wye connected three phase padmounted transformers have external ground connection
- Proposed modification to clause 7.2 of C57.12.34 allows for these 90%+ transformers to have the standard induced voltage and applied voltage tests as per C57.12.00, with induced voltage being at two times the rated winding voltage. by removing the ground strap from the X0 or X0H0 neutral bushing, before the dielectric tests
- For less than 10% of the transformers that have internal neutral connection to ground, the special induced voltage test shall be conducted by applying a test voltage that induces in the HV winding a line-to-ground voltage close to the specified value of the applied voltage test by either:

  a) Using a three phase source, considering that the components are suitable for the resulting line to line voltages that will be present between phases, corresponding to $\sqrt{3}$ times the line to ground voltage

  b) Using a single phase source, applying the voltage to one phase at the time, for those transformers where the line to line voltage exceeds the dielectric rating of the components. This option will prevent the line to line voltage to be affected by the $\sqrt{3}$ factor with the use of the three phase source

Recommend changes to sect. 7.2

7.2 Dielectric tests

For wye-wye connected transformers with a high voltage winding neutral terminal with interconnected or internally grounded neutrals, no applied voltage test is required on a winding greater than 600 V.

When high- or low-voltage terminations are used that fall under IEEE Std 386, they may not be suitable for chopped wave testing; therefore, when terminations that conform to IEEE Std 386 are used (bushing wells, 600 A integral bushings, etc.) chopped wave tests are not required.

Reasoning

1) Improvements over current version of C57.12.34-2022

   a) Clarifies that scope of the special induced voltage test is for Wye-Wye connected transformers with a high voltage winding neutral terminal permanently grounded, as oppose to for all Wye-Wye transformers

   b) Adds statement that for cases where the neutral terminal ground connection can be removed, both the applied voltage test and the induced voltage test as specified in IEEE C57.12.00 shall be performed.

   c) Gives the option for the minority of cases where the neutral is internally grounded, to either perform the special induced voltage test with a three phase source, with using components with the proper dielectric strength between phases, or to use a single phase source to perform the test on one phase at the time.

2) Resolves conflict of imposing a limit of a line to ground voltage requirement of the applied voltage test, to a line to line voltage between phases of certain components (loadbreak and dual voltage switches), where between them there is a relationship of $\sqrt{3}$ when using a three phase source

Conflicts with limiting Line to Line voltages with Line to Ground Specifications of Applied Voltage Tests Examples with common Wye-Wye HV Ratings

HV rating (V)	Applied- voltage test (kV rms)	Standard Induced Voltage Test (Line-GND) (V)	Special Induced Voltage Test (Line-GND) (V)	Proposal limiting test voltage between line terminals as per the applied voltage test values
12,470 GrdY / 7,200	34	14,400	25,912	19,630
24,940 GrdY / 14,400	40	28,800	40,000	**23,094**
34,500 GrdY / 19,920	50	39,840	50,000	**28,867**

Revised Fall 2024 Minutes:

Distribution Transformer Subcommittee
Working Group Minutes

Document #: PC57.12.34

Document Title: Requirements for Pad-Mounted, Compartmental Type, Self-Cooled, Three Phase Distribution Transformers, 10 MVA and Smaller; High Voltage, 34.5 Nominal System Voltage and Smaller; Low Voltage,15kV Nominal System Voltage and Below

Chair: Steve Shull **Vice-Chair**

Secretary Alan Wilks **Percent Complete**

Current Draft Being Worked On: **Dated:**

Meeting Date: October 28, 2024 **Time:** 3:15 – 4:30

Attendance:

A sign-up sheet was circulated with total of 100 in attendance including 35 Members and 65 Guests of which 13 requested Membership.

First Name	Last Name	Company	Role
Rehan	Ali	Siemens Energy	Member
Jared	Bates	Oncor Electric Delivery	Member
Noah	Chesser	Oncor Electric Delivery	Member
Rhett	Chrysler	ERMCO	Member
Thomas	Dauzat	AEP-SWEPCO	Member
Miguel	Garcia	Hitachi Energy	Member
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Gary	King	Consultant	Member
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Joshua	Yun	Virginia Transformer Corp.	Member
Michael	Zarnowski	Carte International	Member

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Jim	Cai	JSHP Transformer	Guest
Alonso	Castillo	Kaedi Energy	Guest
Matthew	Chisholm	IFD Corporation	Guest
Brian	Connelghton	Cleveland-Cliffs	Guest
Janet	Crockett	Fayetteville PWC	Guest
John	Crotty	Ameren	Guest
Craig	DeRouen	ERMCO	Guest
Jeff	Door	H-J Family of Companies	Guest
Fernando	Duarte	EPRI	Guest
Roger	Dugan	EPRI Retired	Guest
Qusai	Elnimri	Vantran Transformer	Guest
Kevin	Frye	Central Moloney, Inc.	Guest
Jose	Gamboa	H-J Family of Companies	Guest
Luke	Grandbois	IFD Technologies	Guest
Kyle	Heiden	EATON Corporation	Guest
John	Hipchen	Copper Development ASSN.	Guest
Thomas	Holifield	Howard Industries	Guest
Mohammad	Iman	MGM Transformer Co.	Guest
John	John	Virginia Transformer Corp.	Guest
Braxton	Jones	SD Meyers	Guest
Qasin	Khan	NEETRAC - Georgia Tech	Guest
Rebecca	Kim	Cheryong Electric	Guest
Evan	Knapp	EATON Corporation	Guest
Kang Jin	Lee	Cheryong Electric	Guest
Nicholas	Manske	Oncor Electric Delivery	Guest

First Name	Last Name	Company	Role
Bryan	Marquardt	Cleveland-Cliffs	Guest
Katherine	Marulanda	Magnetron	Guest
Nader	Masoud	Central Moloney, Inc.	Guest
Brian	McBride	Cargill, Inc.	Guest
Johnny	Meng	Alpha Plottex NC Inc	Guest
Tim	Menter	Lincoln Electric System	Guest
Fernando	Meza	Power Partners	Guest
Justin	Minikel	EATON Corporation	Guest
Humberto	Moreno	Siemens Energy	Guest
Charles	Morgan	Eversource Energy	Guest
Fredy	Murcia	Siemens Energy	Guest
Hugo	Murillo	H-J Family of Companies	Guest
Joel	Pacas	IFD Technologies	Guest
Nicholas	Post	WEC Energy Group	Guest
Ion	Radu	Hitachi Energy	Guest
David	Rohrer	First Energy	Guest
Stefano	Schindler	Reinhausen	Guest
Joseph	Schumack	Ameren	Guest
Masoud	Sharifi	SGRE	Guest
Mochande	Shiv	Siemens Energy	Guest
Mohammad	Sohail	Trench Limited	Guest
Vedrana	Starcevicprebeg	Koncar Dfst	Guest
Tim	Tillery	Howard Industries	Guest
Fernando	Tirado	Prolec GE	Guest
Alan	Traut	Howard Industries	Guest
Joshua	Verdell	ERMCO	Guest
David	Walker	MGM Transformer Co.	Guest
Shelby	Walters	Howard Industries	Guest
Koray	Yavuz	Norak Electric	Guest
Malia	Zaman	IEEE SA	Guest
Bryan	Marquardt	Cleveland-Cliffs	Guest

Meeting Minutes:

The Chair called the meeting to order at 3:15 P.M. CDT on October 28, 2024. Attendees verbally identified themselves by name and affiliation.

1. IEEE Privacy Policy
   The Chair verbally stated and explained in detail all the information according to IEEE Privacy Policy.

2. Meeting Quorum
   The Chair displayed the members of the WG and a quorum was established.

3. Agenda Approval
   The Chair displayed the agenda for this meeting. A motion was made by Tom Dauzat and seconded by Lee Matthews to “Approve the Agenda as displayed”. The Chair asked any opposition to the displayed Agenda to which no opposition was observed. The Agenda was approved as displayed.

4. Minutes Approval
   The Chair stated the Last Meeting Minutes were available online. A motion was made by

Jerry Murphy and seconded by Mike Thibault to "approve the Last Meeting Minutes as shown online". The Chair asked any opposition to approved these minutes as posted to which no opposition was observed. The Last Meeting Minutes were approved.

5. Confirmation of IEEE SA Essential Patent Statement
   The patent information request was displayed. The chair provided an opportunity for participants to identify patent claim(s)/patent application claim(s) and/or if a participant is personally aware of patent claim(s)/patent application claim(s) that may be essential for the use of this standard. There were no responses to this request so no patent claim(s)/patent application claim(s) were identified.
6. IEEE SA Copyright Policy Statement and Participant Behavior Policy were shown without any discussion or objection.
7. Old Business

   Task Force Reports

   - TF #2 – The Task Force reported that "Although we are seeing higher kVA units for the voltages listed in Table 3, these requests are tied specifically to projects customized to the site, including the special short circuit current designs to accommodate these requirements.

     As such, the TF did not feel it would be appropriate for an IEEE standard to increase the kVA ratings in Table 3.

     However, the TF did recommend that the addition of voltages of 416Y/240 and 690Y/398."

     A motion was made by Igor Simonov and seconded by Gary King to accept these changes. The Chair asked if there was any opposition to approved this motion as presented to which no opposition was observed.

   - TF #5 – Update bushing drawings to reference C57.19.02 and make them consistence with a common labeling practice, i.e. X_3 and not X3. Since this was editorial, no motion or vote was taken.

     This taskforce also made modification to the standard to incorporate the reference to C57.19.02. This resulted in the removal of Figure 19 and 20 since these are reflected in C57.19.02. The tables in these figures were moved to Article 8.7.3 *600 V and below terminals*. This also resulted in modification of this section which is reflected in the current draft.

   - TF #4 Test Review – A presentation was made by Michael Zarnowski and Andrew Larison related to Article 7.2 *Dielectric Tests*. The issue that was seen was using an induced test voltage of 3.46X rated + 1000 which at the 125 kV BIL and 150 kV BIL Voltage Test Limits exceeded induced test limits exceed voltage ratings for certain accessories such as dual voltage switches and underoil load break switches and exceeds the interphase insulation levels and under oil lead spacing. This had resulted in advertent failures. The recommendation of the task force was to change the value to 2X rated voltage. After considerable discussion, a motion was made by Gary King to use the 2X rated induced test voltage. The motion was seconded by Rhett Chrysler and the motion passed. ~~The article will be changed to:~~

     ~~*Dielectric test levels shall be in accordance with the distribution transformer test levels in IEEE Std C57.12.00.*~~[1]

     Having run out of meeting time, the meeting adjourned at 4:30 P.M. CDT.

Submitted by: Alan Wilks

[1] Removed by Vote. See Spring 2025 meeting minutes.

Date: 10/28/2024.