

Annex C Distribution Subcommittee – Chair: Jerry Murphy

March 22, 2023

Milwaukee, WI USA

Chair: Jerry Murphy

Vice-Chair: Josh Verdell

Secretary: Martin Rave

C.1 General Opening

This meeting there were leadership changes within the subcommittee with Jerry Murphy taking over for Ed Smith as Chair, Josh Verdell moving to the Vice-Chair role, and Martin Rave graciously volunteering to take over as the subcommittee Secretary. Jerry opened the meeting welcoming everyone to the meeting and provided a Standards Report. To establish a quorum, a list of members was displayed, and a count of members was taken. We did have a quorum with 57 members in attendance by count of those identified on a slide presented in the meeting. Recorded attendance gave 146 in attendance and 67 members. List of attendees and affiliation attached below.

The agenda was reviewed, a motion was made to approve by Dan Sauer, seconded by Dan Mulkey, and approved by unanimous acclamation of the members in attendance.

The Fall 2022 meeting minutes were reviewed, a motion was made to approve by Tom Dauzat, seconded by Dan Sauer, and approved by unanimous acclamation of the members in attendance.

At this time, Josh Verdell reviewed the membership changes. A slide was presented welcoming the new member of the subcommittee before proceeding with the working group and task force reports.

C.2 Working Group and Task Force Reports

██████ C57.12.20 – Overhead Distribution Transformers – Al Traut

Al presented the following minutes from the working group meeting on March 20, 2023 at 11:00 a.m. with 76 in attendance.

1. Call to order
The meeting was called to order by the Chair (Al Traut) at 11:00AM on Monday, March 20, 2022.
2. Essential patent statement and copyright slides.
There was a call for essential patent by the Chair. There were none brought forward. The Chair announced if there was one to let the Chair or Vice Chair know. The IEEE copyright slides were shown to the WG.
3. Quorum Verification
A members list was displayed, and members were asked to complete digital poll. 33 of 47 members were present. A Quorum was declared.
4. Approval of agenda for this meeting

The Chair sent out the Agenda prior to the meeting for review. Agenda was approved without any opposition.

5. Approval of minutes of the previous meeting
The Chair sent out the minutes of the F22 minutes prior to the meeting for review. Minutes were approved without any opposition.
6. Chair Report
The active PAR expires in 2023. The formation of the Comment Resolution Committee was formed.
7. Old Business
 - A. Review of all 48 comments
 - B. Motion by S. Shull to accept comments as recommended by the Comment Resolution Group without modification. Seconded by E. Smith. Motion unanimously approved.
 - C. Reminder to the chair that a red-line copy of the draft must be submitted to RevCom.
8. New Business

No new business
9. Next meeting--date and location

Fall 2023 – Kansas City (Westin at Crown Center), Missouri USA, Oct 22 – 26, 2023**

10. Adjournment

The meeting was adjourned at 12:00 PM

Submitted by: Kendrick Hamilton

Date: 20/03/2023

ATTENDANCE

| | Last Name | First Name | Role | Company |
|----|------------|-------------|-----------|-------------------------------------|
| 1 | Ali | Rehan | Guest | Siemens Energy |
| 2 | Almeida | Nabi | Guest | Prolec |
| 3 | Arora | Kush | Guest | Reinhausen |
| 4 | Ayala | Alejandro | Guest | Power Partners |
| 5 | Biggie | Kevin | Guest | Weidmann Electrical Technology |
| 6 | Borck | Christopher | Guest | EATON Corporation |
| 7 | Brown | Darren | Member | Howard Industries |
| 8 | Brown | Chris | Guest | San Diego Gas & Electric |
| 9 | Callsen | Thomas | Member | Weldy-Lamont Associates |
| 10 | Chisholm | John | Guest | IFD Corporation |
| 11 | Chisholm | Matthew | Guest | IFD Corporation |
| 12 | Chrysler | Rhett | Member | ERMCO |
| 13 | Dauzat | Thomas | Member | General Electric |
| 14 | DeRouen | Craig | Member | ERMCO |
| 15 | Di Biase | Antonio | Guest | Tempel |
| 16 | Duarte | Fernando | Guest | EPR1 |
| 17 | Garcia | Benjamin | Member | Southern California Edison |
| 18 | Garza | Hector | Guest | Orto de Mexico |
| 19 | Gaytan | Carlos | Member | Prolec GE |
| 20 | Ghafourian | Ali | Member | H-J Family of Companies |
| 21 | Gonzales | Michael | Guest | Southern California Edison |
| 22 | Grajeta | Rafael | Guest | EATON Corporation |
| 23 | Hall | Michael | Guest | Mid Central Electric |
| 24 | Hamilton | Kendrick | Secretary | United Standard Electric |
| 25 | Hampton | Kenneth | Member | Baltimore Gas & Electric |
| 26 | Issack | Ramadan | Member | American Electric Power |
| 27 | Khan | Qasim | Guest | Neetrac Georgia Tech |
| 28 | Knapp | Evan | Member | EATON Corporation |
| 29 | Kozer | Patrick | Guest | Northeast Transformer Services, LLC |
| 30 | Kozer | Gilbert | Guest | Northeast Transformer Services, LLC |
| 31 | Larison | Andrew | Guest | Hitachi Energy |
| 32 | Liegl | Angela | Member | EATON Corporation |
| 33 | Macias | Alejandro | Guest | Centerpoint Energy |
| 34 | Marquardt | Bryan | Guest | Cleveland Cliffs |
| 35 | McBride | Brian | Guest | Cargill, Inc. |
| 36 | Menter | Tim | Guest | Lincoln Electric System |
| 37 | Miller | Kent | Guest | T&R Electric Supply Co. |
| 38 | Minikel | Justin | Guest | EATON Corporation |

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|----|----------------|-----------|------------|--------------------------------------|
| x | Mai | Tim-Felix | Guest | Siemens Energy |
| 38 | Martinez | Joaquin | Guest | Siemens Energy |
| 39 | Menter | Tim | Guest | Lincoln Electric System |
| 40 | Miller | Kent | Guest | T&R Electric Supply Co. |
| 41 | Minikel | Justin | Guest | EATON Corporation |
| 42 | Morgan | Michael | Member | Duke Energy |
| 43 | Morris | Tim | Guest | Walton EMC |
| 44 | Munoz Molina | Martin | Guest | Orto de Mexico |
| 45 | Murillo | Hugo | Guest | H-J Family of Companies |
| 46 | Parkinson | Dwight | Member | EATON Corporation |
| 47 | Posadas | Daniel | Guest | Prolec |
| 48 | Radu | Ion | Guest | Hitachi Energy |
| 49 | Reepe | Robert | Member | Georgia Power Co. |
| 50 | Salinas | Fernando | Guest | Power Partners |
| 51 | Sampat | Mahesh | Guest | EMS Consulting Inc. |
| 52 | Sanchez | Albert | Member | Knoxville Utilities Board |
| 53 | Schneider | Jeffrey | Guest | Power Partners/Spire Power Solutions |
| 54 | Shannon | Michael | Member | Rea Magnet Wire |
| 55 | Shingari | Avijit | Guest | Pepco Holdings Inc. |
| 56 | Shull | Stephen | Member | BBC Electrical Services, Inc. |
| 57 | Siebert-Timmer | Audrey | Member | IFD Technologies |
| 58 | Silgado | Adrian | Guest | IFD Technologies |
| 59 | Smith | Edward | Vice-Chair | H-J Family of Companies |
| 60 | Stank | Markus | Guest | Maschinenfabrik Reinhausen |
| 61 | Tennant | Craig | Guest | H-J Family of Companies |
| 62 | Theisen | Eric | Member | Metglas, Inc. |
| 63 | Thibault | Michael | Member | Pacific Gas & Electric |
| 64 | Traut | Alan | Chair | Howard Industries |
| 65 | Valentin | Reinaldo | Member | Duke Energy |
| 66 | Van Horn | Jeremy | Member | IFD Technologies |
| 67 | Vartanian | John | Member | National Grid |
| 68 | Verdell | Joshua | Member | ERMCO |
| 69 | Vyas | Pragnesh | Member | Sunbelt-Solomon Solutions |
| 70 | Webb | Bruce | Member | Knoxville Utilities Board |
| 71 | Wilks | Alan | Member | Consultant |
| 72 | Zaman | Malia | Guest | IEEE SA |

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|----|--------------|-------------|------------|-------------------------------|
| 39 | Moreno | Andre | Guest | Siemens Energy |
| 40 | Morgan | Michael | Member | Duke Energy |
| 41 | Mulkey | Daniel | Member | Mulkey Engineering Inc. |
| 42 | Munoz Molina | Martin | Guest | Orto de Mexico |
| 43 | Naja | Ismael | Guest | EATON Corporation |
| 44 | Parenti | Tyler | Guest | Cargill, Inc. |
| 45 | Parkinson | Dwight | Member | EATON Corporation |
| 46 | Peterson | Caroline | Guest | XCEL Energy |
| 47 | Posadas | Daniel | Member | Prolec |
| 48 | Prince | Jarrod | Member | ERMCO |
| 49 | Radu | Ion | Member | Hitachi Energy |
| 50 | Rave | Martin | Member | ComEd |
| 51 | Reepe | Robert | Member | Georgia Power Co. |
| 52 | Rush | Mason | Guest | Central Moloney, Inc. |
| 53 | Salinas | Fernando | Guest | Power Partners |
| 54 | Sanchez | Albert | Member | Knoxville Utilities Board |
| 55 | Sandoval | Alberto | Guest | EATON Corporation |
| 56 | Sewell | Russ | Guest | Quality Switch |
| 57 | Shannon | Michael | Member | Rea Magnet Wire |
| 58 | Shingari | Avijit | Guest | Pepco Holdings Inc. |
| 59 | Shull | Stephen | Member | BBC Electrical Services, Inc. |
| 60 | Smith | Edward | Vice-Chair | H-J Family of Companies |
| 61 | Snyder | Steven | Guest | Hitachi |
| 62 | Spaulding | James | Guest | Fort Collins Utilities |
| 63 | Stankes | Dave | Guest | 3M |
| 64 | Stretch | Kerwin | Guest | Siemens Energy |
| 65 | Sullivan | Christopher | Guest | Westmark Partners |
| 66 | Syed | Ali | Guest | Comed |
| 67 | Thibault | Michael | Member | Pacific Gas & Electric |
| 68 | Traut | Alan | Chair | Howard Industries |
| 69 | Valentin | Reinaldo | Member | Duke Energy |
| 70 | Vartanian | John | Member | National Grid |
| 71 | Verdell | Joshua | Member | ERMCO |
| 72 | Vyas | Pragnesh | Member | Sunbelt-Solomon |
| 73 | Webb | Bruce | Member | Knoxville Utilities Board |
| 74 | Wilks | Alan | Member | Consultant |
| 75 | Zaman | Malia | Guest | IEEE SA |
| 76 | Zuiderveen | Thomas | Guest | IFD Technologies |

██████ C57.12.28, .29, .30, .31 & C57.12.32 – Enclosure Integrity – Dan Mulkey

Dan Mulkey presented the following minutes from the working group meeting on March 21, 2023 at 8:00 a.m. in with 69 in attendance.

1. Dan Mulkey called the meeting to order at 8:01 AM CST. Group introductions were made.
2. Opening remarks and announcements
 - a. AMS system has been discontinued. Paper rosters were circulated.
 - b. Luke Grandbois and Matthew Chisholm assisted Dan Mulkey with secretary and vice president duties as both Jeremy Van Horn and Audrey Siebert-Timmer could not make the meeting.
3. Dan Mulkey reviewed IEEE SA Copyright Policy and Essential Patent Claims. No issues were raised.
4. Membership changes were noted:
 - a. Added: Craig Derouen
 - b. Removed: Said Hachichi (deceased)
5. Quorum was verified. The working group consisted of 58 members, requiring 30 for quorum. 34 members were counted at the start of the meeting. Attendance records later confirmed 40 members attended.
6. Dan Mulkey requested approval of the Spring 2023 Agenda with the correction of C57.12.29 to C57.12.32. Paul Chisholm made a motion, second by Jerry Murphy. Agenda was unanimously approved.
7. Dan Mulkey requested approval of the Fall 2023 Minutes. Jerry Murphy made a motion, second by Steve Shull for approval of the minutes. Minutes were unanimously approved.
8. Status of Standards:
 - a. C57.12.28 Standard for Pad-Mounted Equipment – Enclosure Integrity, Published July 15, 2014
 - i. Expires: 12/31/2024
 - ii. PAR expiration: 12/31/2024
 - iii. Status: Draft 5 in ballot process
 - b. C57.12.29 Standard for Pad-Mounted Equipment – Enclosure Integrity for Coastal Environments, Published August 8, 2014
 - i. Expires: 12/31/2024
 - ii. PAR expiration: 12/31/2024
 - iii. Status: Draft 5 in ballot process
 - c. C57.12.30 Standard for Pole-Mounted Equipment – Enclosure Integrity for Coastal Environments, Published March 4, 2021
 - i. Expires: 12/31/2030
 - d. C57.12.31 Standard for Pole Mounted Equipment – Enclosure Integrity, Published February 26, 2021
 - i. Expires: 12/31/2030
 - e. C57.12.32 Standard for Submersible Equipment – Enclosure Integrity, Published Aug 8, 2019

- i. Expires: 12/31/2029
- 9. Old business:
 - a. Dan Mulkey reviewed status of standards.
 - i. Draft 5 of C57.12.28 and Draft 5 C57.12.29 are in the ballot process.
 - b. Dan Mulkey reviewed the revision plan for C57.12.32 submersible standard.
 - i. Request PAR after this meeting, this will give us 6 meetings before we begin ballot Oct 2026 with the goal of finishing ballot in 2027.
 - ii. Michael Thibault made a motion, second by John Vartanian, to add “i) Submersible Switch” to 1.1 Scope. Motion passed without opposition.
 - iii. Discussion around “h) Submersible Control Box”. Group agreed to review the language and decide if battery or communication box is required to be called out or if it is already covered.
 - iv. Thomas Dauzat made a motion to add “without cathodic protection” to the last line of 1.1 Scope. The motion received no second and was tabled.
 - v. Comment from Ali Garza: suggested that 1.1 Scope list items should reference the associated IEEE standard; Jerry Murphy stated bibliography covers most, if not all, of the references on the list. No motion made.
 - vi. Motion by Al Traut, second by Josh Verdell, to remove submersible switchgear as they are covered by another standard: C37.75. Motion passed without opposition.
 - vii. Question posed by Brian Kaplonski: should we remove language from standard and reference C37.75 in the bibliography (specifically switch and switchgear)? No decision made.
 Note PC37.75 Draft Standard for Pad-Mounted, Pole-Mounted, and Submersible Switchgear Enclosures and Associated Control Enclosures - Coastal and Non-Coastal Environmental Integrity is presently in re
 - c. Dan Mulkey reviewed the revision plan for C57.12.30 and C57.12.31 pole-mounted standards.
 - i. Request PAR Oct 2026, this will give us 5 meetings before we begin ballot Oct 2029 with the plan of finishing ballot in 2030.
 - d. Dan Mulkey reviewed proposed revisions to the C57.12.32 scope and purpose for C57.12.32 submersible standard.
 - i. Scope modification: added “enclosure” prior to integrity
 - ii. Purpose modification: added “and positive safety features”
 - e. Justin Minikel presented Lamp Selection Taskforce findings where they reviewed bulb / lamp selection.
 - i. UVA vs UVB:
 - 1. UVA longest wavelength, lowest energy, 95% of terrestrial exposure
 - 2. UVB highly damaging wavelength, 5% of terrestrial exposure
 - ii. Data review:
 - 1. F16 / S17 Presentation by PPG: UVA equally capable of weeding out poor performing systems compared to UVB

2. F17 Presentation by PPG and Sherwin Williams: most coatings maintain > 70% gloss retention after 1200 hour UVA exposure, UVA still captures the poor performers
3. Additional supporting data Eaton 3-year weather study (2017-2021): supports previous work
- iii. Other considerations:
 1. The SCAB corrosion test should continue to use UVB pre-aging step until a suitable alternative test method can be defined.
 2. UV requirements may need to be modified in C57.12.32 as vaults have different terrestrial exposure levels.
- iv. Taskforce recommendation: change preferred test method to ASTM G154, Cycle 1 (UVA-340) which more closely matches real world sunlight exposure. Proposed two options for test criteria:
 1. Option 1: 1000 hrs, >70% gloss retention (loss of gloss not exceed 30%)
 2. Option 2: 1500 hrs, >50% gloss retention (loss of gloss not exceed 50%)
- v. Taskforce recommendation: keep historical test method as optional as it is still used for the SCAB test.
 1. ASTM C154, Cycle 2 (UVB-313), irradiance modified to 0.48 W/m².
 2. 500 hrs exposure, > 50% gloss retention (loss of gloss not exceed 50%)
- vi. Group discussion:
 1. Justin Minikel is working to make the findings of NEETRAC's research available to the Working Group.
 2. Tiffany Lucas noted that if the standard states that there are multiple acceptable testing options, certain customers will request that all testing options be performed, which will create additional work for transformer manufacturers.
 3. Thomas Dauzat referenced ASTM standards related to paint tests:
 - a. G154 → simulator
 - b. G155 → bulb standard
 - c. D7869 → automotive / aerospace reference
 4. Brian Kaplonski proposed that the Working Group should have a goal regarding what we are working towards with the information presented by Justin Minikel. No decision was made.

10. New business:

- a. Motion by Martin Bachand, second by Justin Minikel, to create a taskforce to investigate the impact test (reference C57.12.28 and C57.12.29) and provide some direction to the Working Group. Motion passed with no opposition.
 - i. Taskforce Chair: Justine Minikel (Eaton Corporation)
 - ii. Taskforce Members: Martin Bachand (Cloverdale Paint), Nabi Almeida (Prolec GE), Mike Zarnowski (Carte International), Daniel Mulkey (Mulkey Engineering Inc.)
- b. Jim Spaulding inquired if there is a reference for fire protection in this standard. Group discussed that C57.12.28 includes fire resistance in clause 4.1.9.

1. Next meeting: October 24, 2023 in Kansas City, MO, USA

- c. The following attendees requested membership and will be added to membership for the Fall 2023 meeting: **Nabi Almeida, Thomas Callsen, Gilbert Kozer, Patrick Kozer, Tiffany Lucas, Mason Rush, Fernando Salinas**
2. The meeting was adjourned at 9:07 AM CST.

Submitted by: Luke Grandbois

Date: March 21, 2023

List of Members:

Martin Bachand (Cloverdale Paint Inc.)
Darren Brown (Howard Industries)
John Chisholm (IFD Technologies)
Rhett Chrysler (ERMCO)
Douglas Craig (Richards Manufacturing Co.)
Thomas Dauzat (AEP)
Benjamin Garcia (Southern California Edison)
James Gardner (Prolec GE)
Carlos Gaytan (Prolec GE)
Ali Ghafourian (H-J Enterprises, Inc.)
Kenneth Hampton (Baltimore Gas & Electric)
Ramadan Issack (American Electric Power)
Gary King (Howard Industries)
Brian Klaponski (Carte International Inc.)
Andrew Larison (Hitachi Energy)
Alejandro Macias (CenterPoint Energy)
Justin Minikel (EATON Corporation)
Michael Morgan (Duke Energy)
Daniel Mulkey (Mulkey Engineering Inc.)
Jerry Murphy (Reedy Creek Energy Services)
Dwight Parkinson (EATON Corporation)
Vinay Patel (Consolidated Edison Co. of NY)
Ion Radu (Hitachi Energy)
James Ratty (Electronic Technology Inc.)
Martin Rave (ComEd)
Robert Reepe (Georgia Power Co.)
Pedro Salgado (Electronic Technology Inc.)
Avijit Shingari (Pepco Holdings Inc.)
Stephen Shull (BBC Electrical Services, Inc.)
Edward Smith (H-J Family of Companies)
James Spaulding (Fort Collins Utilities)
Travis Spoone (EATON Corporation)
Michael Thibault (Pacific Gas & Electric)
Alan Traut (Howard Industries)
Reinaldo Valentin (Duke Energy)
John Vartanian (National Grid)

Joshua Verdell (ERMCO)
Shelby Walters (Howard Industries)
Alan Wilks (Consultant)
Michael Zarnowski (Carte International)

List of Guests:

Thomas Callsen (Weldy-Lamont Associates)
Matthew Chisholm (IFD Technologies)
William Coughlan (Metglas, Inc.)
Qusai Elnimri (VanTran Industries, Inc.)
Michael Gonzales (Southern California Edison)
Luke Grandbois (IFD Technologies)
Garza Hector (Orto de Mexico)
Traci Hopkins (H2Scan)
Gilbert Kozer (Northeast Transformer Services, LLC)
Patrick Kozer (Northeast Transformer Services, LLC)
Jason Lambert (JST Power)
Angela Leigl (EATON Corporation)
Tiffany Lucas, P.E. (Prolec GE)
Kenneth McKinney (UL LLC)
Timothy Menter (Lincoln Electric System)
Kent Miller (T&R Electric Supply Co.)
Martin Munoz (Orto de Mexico)
Ismael Naja (EATON Corporation)
Michael Pappas (Roechling Industrial)
Miguel Plascencia (Pacific Gas & Electric)
Mason Rush (Central Moloney Inc)
Fernando Salinas (Power Partners)
Albert Sanchez (Knoxville Utilities Board)
Jaber Shalabi (VanTran Industries, Inc.)
Ali Syed (ComEd)
Chris Talbert (JST Power)
Bruce Webb (Knoxville Utilities Board)

██████ C57.12.34 – Three Phase Pad-Mount Transformers – Steve Shull

Steve Shull reported that the group was in the process of starting up a new PAR and that they would continue work as a Working Group at the fall meeting. Following minutes were submitted..

The Chair called the meeting to order at 3:15 P.M. EST on March 20, 2023. Attendees identified themselves by name and affiliation verbally.

1. Agenda Review
The Chair displayed the agenda for this meeting. Since this was an inaugural meeting under the new PAR, the group verbally approved the Agenda.
2. Minutes Approval
Minutes of the PAR Study Group Meeting in Charlotte on 10/17/22 were verbally approved.

3. 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.

4. IEEE SA Copyright Policy Statement

IEEE-SA's copyright policy is described in Clause 7 of the *IEEE-SA Standards Board Bylaws* and Clause 6.1 of the *IEEE-SA Standards Board Operations Manual*. The Chair stated that any material submitted during standards development, whether verbal, recorded, or in written form, is a Contribution and shall comply with the IEEE-SA Copyright Policy. The Chair displayed this copyright policy.

5. IEEE SA Participant Behavior

All participants in IEEE-SA activities are expected to adhere to the core principles of the IEEE Code of Ethics, IEEE Code of Conduct and the Standards Board Bylaws.

6. New Business

There were a number of items that were already identified to be review. These were:

- Update all references to latest revision of IEEE 386.
- Update secondary voltages, i.e. Many renewables are at 690Y/398 but they are constructed like 480Y/277 ratings, Add a new secondary voltage of 416Y/240. This voltage is currently being used to supply Server Farms.
- Revise A.10.2 Hot spot thermal sensor-Resistor temperature detector (RTD) to add more detail.
- Review the values for the induced voltage test using a three phase source and impulse testing procedure above the 600 volt threshold. We need to insure that the impulse testing values conform to IEEE Std. C57.12.00, particularly as they might pertain to this standard.
- Update bushing drawings to reference C57.19.02 and make them consistent with a common labeling practice, i.e. X3 and not X₃.

The Chair asked for any additional suggestions on changes that may be included for the next update. There was one suggestion concerning adding a decal or stencil on the outside of the transformer something like this "Do Not Landscape Around This Transformer". It was indicated that this is typically user specified, but we should think about adding it to the standard. Touch temperature was briefly discussed and all were encouraged to attend the TF on Touch Temperature later that day. The group was asked to think about changes that need to be added and bring them to the next meeting in Kansas City or email the Chair.

7. The meeting adjourned at 3:45 P.M. EST.

Submitted by: Alan Wilks

Date: 3/21/2023

Attendance:

| NAME | Company |
|-----------|----------------|
| Rehan Ali | Siemens Energy |

| NAME | Company |
|------------|------------------------|
| Iasin Khan | NEETRAC - Georgia Tech |

| NAME | Company |
|------------------|----------------|
| Fernando Salinas | Power Partners |

| | | | | | |
|---------------------|--------------------------------|------------------|-------------------------------------|----------------------|-------------------------------|
| Cheryl Basel | WEG Transformers USA Inc. | Gary King | Howard Industries | Albert Sanchez | Knoxville Utilities Board |
| Jared Bates | Oncor Electric Delivery | Zan Kiparizoski | Howard Industries | Anil Sawant | Virginia Transformer Corp. |
| Brian Baumann | Cargill, Inc. | Brian Klaponski | Carte International Inc. | Jaber Shalabi | VanTran Industries, Inc. |
| Ales Bertuzai | Georg | Gilbert Kozer | Northeast Transformer Services, LLC | Michael Shannon | Rea Magnet Wire |
| Kevin Biggie | Weidmann Electrical Technology | Patrick Kozer | Northeast Transformer Services, LLC | Avijit Shingari | Pepco Holdings Inc. |
| Thomas Callsen | Weldy-Lamont Associates | Andrew Larison | Hitachi Energy | Stephen Shull | BBC Electrical Services, Inc. |
| Razmungo Chapa | WEG Transformers USA Inc. | Weijun Li | Braintree Electric Light Dept. | Edward Smith | H-J Family of Companies |
| John Chisholm | IFD Corporation | Parry Lively | Tempel | James Spaulding | Fort Collins Utilities |
| Matthew Chisholm | IFD Corporation | Alejandro Macias | CenterPoint Energy | Christopher Sullivan | Westmark Partners |
| Rhett Chrysler | ERMCO | Lee Matthews | Consultant | Chris Talbert | JST Power Equipment |
| Will Coughlan | Metglas, Inc. | Tim Menter | Lincoln Electric System | Michael Thibault | Pacific Gas & Electric |
| Thomas Dautat | AEP-SWEPCO | Kent Miller | T&R Electric Supply Co. | Reinaldo Valentin | Duke Energy |
| Antonio Di Biase | Tempel | Rhea Montpool | Schneider Electric | John Vartanian | National Grid |
| Benjamin Garcia | Southern California Edison | Michael Morgan | Duke Energy | Joshua Verdell | ERMCO |
| Miguel Garcia | Hitachi Energy | Daniel Mulkey | Mulkey Engineering Inc. | Pragnesh Vyas | Sunbelt-Solomon Solutions |
| Carlos Gaytan | Prolec GE | Jerry Murphy | Reedy Creek Energy Services | Shelby Walters | Howard Industries |
| Ali Ghafourian | H-J Enterprises, Inc. | Stephen Oakes | WEG Transformers USA Inc. | Bruce Webb | Knoxville Utilities Board |
| Michael Gonzales | Southern California Edison | Tyler Parenti | Cargill, Inc. | Zachery Weiss | WEG Transformers USA Inc. |
| Luke Grandbois | IFD Technologies | Dwight Parkinson | EATON Corporation | Alan Wilks | Consultant |
| Kenneth Hampton | Baltimore Gas & Electric | Martin Rave | ComEd | Guang Yuan | Hitachi Energy |
| Gicvanini Hernandez | Virginia Transformer Corp. | Robert Reepe | Georgia Power Co. | Joshua Yun | Virginia Transformer Corp. |
| Ramadan Issack | American Electric Power | Mason Rush | Central Moloney, Inc. | Michael Zarnowski | Carte International |

C57.12.36 – Distribution Substation Transformers – Jerry Murphy

This working group did not meet.

C57.12.38 – Single-Phase Pad-Mounted Transformers – Ali Ghafourian

Ali Ghafourian presented the following minutes from the working group meeting on March 20, 2023 at 12:55 p.m. with 57 in attendance. Ali also noted that he would be submitting a request for a two year PAR extension.

1. Presiding Officer and Secretary responsible for Meeting Minutes

Ali Ghafourian (Chair) – Presiding Officer, Martin (Marty) Rave (Vice-Chair) and Jarrod Prince (Secretary) are responsible for Meeting Minutes.

2. Call to order, Verification of Quorum, and Chair's remarks

The meeting was called to order by the Chair, Ali Ghafourian, at 1:45 p.m. CDT on Monday, March 20th, 2023, held at the Hyatt Regency Milwaukee Hotel in room, Executive Ballroom (Floor 2).

Quorum was established with 31 out of 53 Working Group members present by a show of hands counted at beginning of the meeting. Per paper rosters, we had 31 members accounted for as being present during the meeting.

The Chair announced to the Working Group that the ballot on Draft 2.8 opened on Monday, February 6th, 2023, and closed on Wednesday, March 8th, 2023.

The ballot results were presented to the Working Group.

The Chair stated the ballot had 96 individuals join the Ballot Group with 84 votes returned (87%, 75% min. required) with 76 approved votes (93%, 75% min. required) with 96 comments to be resolved.

The Chair informed the Work Group that the Technical comments would be reviewed during this meeting and if time allowed the Work Group would proceed to resolve the Editorial and General comments.

3. Presented required IEEE SA Patent and Copyright Policies Slides, Call for Patents

The essential Patent and Copyright presentation slides were shown as required. During the review of the Patent and Copyright Policy slides, the Chair called for all essential Patents and Copyrights amongst the Working Group. No essential Patent or Copyright claims were brought forth to the Chair.

4. Approval of agenda

The agenda (AGENDA C57.12.38_2023_Milwaukee(R1).pdf) was issued to the Working Group two weeks prior to the meeting for review.

The Chair asked the Working Group members for the unanimous approval of the agenda.

Josh Verdell made the first Motion to unanimously approve the agenda.

Stephen Shull (Steve) seconded the Motion.

The agenda was unanimously approved.

5. Approval of minutes of previous meeting

The Fall 2022 meeting minutes (F22-C57.12.38-UnapprovedMinutesR0.pdf) were posted to the Distribution Subcommittee website on Friday, October 28th, 2022, for the Working Group members to review before this meeting.

The Chair asked the Working Group members for the unanimous approval of the Fall 2022 meeting minutes.

Jerry Murphy made the first Motion to unanimously approve the Fall 2022 meeting minutes.

Paul Chisholm seconded the Motion.

The Fall 2022 meeting minutes were unanimously approved.

6. Meeting Discussion Topics

Technical Comments resolved from Ballot on Draft 2.8

- **Comment ID (310440) and # (I-84) on Clause 13 Line 3**

Proposed Change: "Unless otherwise specified, the installation shall be level within 6 degrees of horizontal. If a user's installation requires a greater angle of tilt, the user shall specify the required angle in the purchase specifications."

Disposition Status: Rejected

Disposition Detail: "Specific accessories have different transformer angle of tilt from horizontal requirements/limitations, and it is impractical to list them all in this standard."

Daniel (Dan) Mulkey offered a motion with a second from Stephen (Steve) Shull to not revise the existing language regarding transformer angle of tilt from horizontal. This motion was unanimously approved by the Working Group.

- **Comment ID (310437) and # (I-81) on Clause 10.2 and Line 17**

Proposed Change: Add "(trade size)" after "UNC" (2 places)

Disposition Status: Accepted

Disposition Detail: Not required.

Stephen (Steve) Shull offered a motion with a second from Daniel (Dan) Mulkey to include "(trade size)" after UNC and NPT values specified in the standard since there is no metric equivalent. This motion received 17 votes For and 2 votes Against and 12 Abstentions. The motion passed.

- **Comment ID (310368) and # (I-68) on Clause 4.2 and Line 6**

Proposed Change: Does the placing of the Footnote "c" reference in Table 3 mean that 150kV BIL is included as well as 125kV BIL? Needs clarification...

Disposition Status: Revised

Disposition Detail: Change Table 3 to add 34 500GrdY/19 920 125 BIL record and remove footnote c from 150 BIL and add to 125 BIL record similar to C57.12.20.

Michael (Mike) Thibault offered a motion with a second from Edward (Ed) Smith to add a record for 125 kV BIL for 34 500GrdY/19 920 V in Table 3 which needs to refer to footnote "c". The reference to footnote "c" should be removed from the record for the 150 kV BIL 34 500GrdY/19 920 V in Table 3. This motion was unanimously approved by the Working Group.

- **Comment ID (309585) and # (I-13) about the Scope**

Proposed Change: Revised Scope: These transformers are rated 250 kVA and smaller with primary voltages of 34 500 GrdY/19 920 V and below for operation between one phase and grounded neutral and secondary voltages of 480/240 V and below...

Disposition Status: Rejected

Disposition Detail: The Working Group will take this up for consideration for possible change in a future revision.

Daniel (Dan) Mulkey offered a motion with a second from Stephen (Steve) Shull to reject the comment regarding changing the wording in the standard referencing “high voltage” to “primary voltage” and “low voltage” to “secondary voltage”. This motion was unanimously approved by the Working Group.

The next revision of the Draft (Draft 2.9) will include all changes that have been labeled as Accepted or Revised during the Ballot Comment review.

Ballot Resolution Committee Permission

Daniel (Dan) Mulkey offered a motion with a second from Edward (Ed) Smith to authorize the Ballot Resolution Committee to resolve any Editorial and General Ballot Comments and bring any other ballot comments that are deemed to be Technical back to the Working Group for review at the next meeting. This motion was unanimously approved by the Working Group.

Before Adjournment

The Chair announced that the Ballot Resolution Committee will be given the ballot comments to review and report back to the Working Group at the Fall 2023 meeting.

The Chair will lead the Ballot Resolution Committee along with the Vice-Chair and Secretary. Additional Members of the Ballot Resolution Committee are listed below.

| | |
|-----------------------|-------------------------|
| Joshua (Josh) Verdell | ERMCO |
| Ramadan Issack | American Electric Power |
| Robert Reepe | Georgia Power Co. |
| Andrew Larison | Hitachi Energy |

The Chair will submit a request for a two-year PAR extension after this Working Group meeting due to the PAR expiring at the end of 2023 and the comments have not been resolved from the initial ballot.

7. Old Business

No old business items were brought forth to the Working Group during the meeting.

8. New Business

No new business items were brought forth to the Working Group during the meeting.

9. Next meeting – Date and Location

The Chair announced the next meeting for Fall 2023 will be held at The Westin Kansas City at Crown Center in Kansas City, Missouri (USA).

Dates: October 22nd – 26th, 2023

10. Adjournment

The Chair adjourned the meeting at approximately 3:00 p.m. CDT.

List of Attendees and Affiliations:

| | | | |
|----|----------------------------|-------------------------------|--------|
| 1 | Jared Bates | Oncor Electric Delivery | Member |
| 2 | Thomas Callsen Weldy | Lamont Associates | Member |
| 3 | John Chisholm | IFD Corporation | Member |
| 4 | Craig DeRouen | ERMCO | Member |
| 5 | Benjamin Garcia | Southern California Edison | Member |
| 6 | Carlos Gaytan | Prolec GE | Member |
| 7 | Ali Ghafourian (Chair) | H-J Enterprises, Inc. | Member |
| 8 | Kenneth Hampton | Baltimore Gas & Electric | Member |
| 9 | Ramadan Issack | American Electric Power | Member |
| 10 | Andrew Larison | Hitachi Energy | Member |
| 11 | Angela Leigl | EATON Corporation | Member |
| 12 | Kent Miller | T&R Electric Supply Co. | Member |
| 13 | Michael Morgan | Duke Energy | Member |
| 14 | Daniel Mulkey | Mulkey Engineering Inc. | Member |
| 15 | Jerry Murphy | Reedy Creek Energy Services | Member |
| 16 | Dwight Parkinson | EATON Corporation | Member |
| 17 | Jarrood Prince (Secretary) | ERMCO | Member |
| 18 | Martin Rave (Vice-Chair) | ComEd | Member |
| 19 | Robert Reepe | Georgia Power Co. | Member |
| 20 | Albert Sanchez | Knoxville Utilities Board | Member |
| 21 | Stephen Shull | BBC Electrical Services, Inc. | Member |
| 22 | Edward Smith | H-J Family of Companies | Member |
| 23 | James Spaulding | Fort Collins Utilities | Member |
| 24 | Markus Stank | Maschinenfabrik Reinhausen | Member |
| 25 | Christopher Sullivan | Westmark Partners | Member |
| 26 | Reinaldo Valentin | Duke Energy | Member |
| 27 | Joshua Verdell | ERMCO | Member |
| 28 | Pragnesh Vyas | Sunbelt-Solomon | Member |
| 29 | Shelby Walters | Howard Industries | Member |
| 30 | Bruce Webb | Knoxville Utilities Board | Member |
| 31 | Alan Wilks | Consultant | Member |
| 32 | Rehan Ali | Siemens Energy | Guest |
| 33 | Kush Arora | Reinhausen Manufacturing Inc. | Guest |
| 34 | Alejandro Ayala* | Power Partners | Guest |
| 35 | Christopher Borck | EATON Corporation | Guest |
| 36 | Chris Brown* | San Diego Gas & Electric | Guest |
| 37 | Fidel Castro* | San Diego Gas & Electric | Guest |
| 38 | Matthew Chisholm* | IFD Technologies | Guest |
| 39 | Will Coughlan | Metglass Inc. | Guest |
| 40 | Thomas Dauzat* | Prolec GE | Guest |
| 41 | Antonio Di Biase | Tempel | Guest |
| 42 | Anacez Dias | Eaton Brazil | Guest |
| 43 | Fernando Duarte* | Electric Power Research Inst. | Guest |
| 44 | Roger Dugan | Electric Power Research Inst. | Guest |
| 45 | Qusai Elnimri | Vantran Industries | Guest |
| 46 | Miquel Garcia* | Hitachi Energy | Guest |

| | | | |
|----|-----------------------|-------------------------------|-------|
| 47 | James Gardner | Prolec GE Waukesha | Guest |
| 48 | Hector Garza | Orto de Mexico | Guest |
| 49 | Michael Gonzales | Southern California Edison | Guest |
| 50 | Jean Hernandez-Mejia* | NEETRAC - Georgia Tech | Guest |
| 51 | Karl Jakob | Cargill, Inc. | Guest |
| 52 | Patrycja Jarosz | IEEE | Guest |
| 53 | Joe Kelly | TCI Sales | Guest |
| 54 | Qasin Khan* | NEETRAC - Georgia Tech | Guest |
| 55 | Evan Knapp | EATON Corporation | Guest |
| 56 | Gilbert Kozer | NE Transformer Services, LLC | Guest |
| 57 | Patrick Kozer | NE Transformer Services, LLC | Guest |
| 58 | Jason Lambert | JST Power Equipment | Guest |
| 59 | Parry Lively | Tempel | Guest |
| 60 | Lee Matthews | Howard Industries | Guest |
| 61 | Brian McBride | Cargill, Inc. | Guest |
| 62 | Tim Menter | Lincoln Electric System (LES) | Guest |
| 63 | Martin Munoz Molina | Orto de Mexico | Guest |
| 64 | Hugo Murillo | H-J Family of Companies | Guest |
| 65 | Ismael Naja | EATON Corporation | Guest |
| 66 | Tyler Parenti* | Cargill, Inc. | Guest |
| 67 | Miguel Plascencia* | Pacific Gas & Electric (PG&E) | Guest |
| 68 | Mason Rush | Central Moloney Inc. | Guest |
| 69 | Fernando Salinas* | Power Partners | Guest |
| 70 | Steve Snyder | Hitachi Energy | Guest |
| 71 | Ali Syed* | ComEd | Guest |
| 72 | Chris Talbert | JST Power Equipment | Guest |
| 73 | Craig Tennant | H-J Enterprises, Inc. | Guest |
| 74 | Elliot White | SD Myers | Guest |
| 75 | Malia Zaman | IEEE | Guest |

C57.12.39 – Tank Pressure Coordination – Carlos Gaytan

This working group did not meet

Task Force on Transformer Efficiency and Loss Evaluation – Phil Hopkinson

Phil presented the following minutes from the task force meeting on March 20, 2023 at 9:30 a.m.

The Fall meeting of the task force met on Monday, October 17, 2022 at 9:30 AM. The meeting was chaired by Philip Hopkinson, the task force chairman. Prior to the meeting, the unapproved agenda and a Power Point presentation addressing several DOE related organizations on distribution transformer loading was circulated to the entire Distribution Transformer Subcommittee. By count from the circulated rosters, 141 persons were in attendance. Without comment on the proposed agenda, the technical presentation was started. A copy of the Power Point presentation is contained in Phil Hopkinson's site under the Distribution Transformer Subcommittee site. The chairman made opening comments regarding the previous meeting looking at dual-kVA nameplate rating of transformers, while the focus of this meeting was on future load growth.

When the slide showing peak versus nameplate loading was discussed, several comments regarding the difference between the peak and average from various regions and even individual meters. This ratio might vary between five and ten. It was stated that the Dan Mulkey slide has an X-axis of percent loading and is slight skewed giving a mode value which would differ from the average value.

The discussion on the possible loss reductions of 20% for the hypothetical NOPR from the DOE 2016, showed the probable solution may only be possible with an amorphous core steel. A slide with calculations on a 25 kVA and 50 kVA, with the current 2016 DOE limits, showed the no load and load loss values at 100% and 50% loading comparing M3 steel and amorphous steel. Interestingly, load loss seems to increase by more than 50% for the amorphous design compared to the M3 core steel design. If the DOE would issue a NOPR calling for 20% lower losses, the result would be chaotic and likely mean that only amorphous cores could practically reach the efficiency only copper windings and amorphous core steel would be needed.

A projection from the EIA indicates that only a 1% per year growth rate in energy may exist until the year 2050. A comment on demographics would certainly permit levels in many regions of the country to exceed this rate by a significant factor. Other projections indicate growth could be as high as 50% by the year 2050. This rate of load growth could still be achieved with M3 core steel.

With the push to reduce hydrocarbon fuels, three electric growth markets were presented. One of these is the transportation electrification. With the average car driving 12000 miles per year and the average of 3 miles per KWH might yield each EV adding about 4000 KWH per year. Heavier vehicles average about 2 miles per KWH. Building electrification is headed to reduce natural gas with heating being replaced by heat pumps. Codes and standards are well underway to promote this growth. The result of this will be to thermally stress transformers on the grid which will be more critical in the future. Many challenges in the final conversion to electric vehicles will be the current inability to provide reliable power to many regions and to provide high speed chargers..

1. Technical Topics

<https://nemaorg137.sharepoint.com/:p/s/ita/EVAqm71P7k5Br2u9O5-4tsBxQHHbiD9RGFpIPs-UdoFJQ?e=9qh1YZ>

DOE has proposed increasing the efficiency for distribution transformers significantly, effective in 2027. Submersible and Network Transformers will remain at the DOE 2016 Efficiency Levels. DOE has added 3750kVA and 5000kVA to the scope of three phase ratings. Phil Hopkinson asked stakeholders from different OEMs to provide info based on test results from different product lines.

- Al Traut (Howard Industries) provided test results on Liquid-filled single phase.
 - 25kV overhead transformers weight would go up about 40%; weight increase much less for amorphous.
 - Research shows that efficiency is reduced with higher loading; and at higher loads amorphous is less-efficient than GOES
 - Amorphous designs are only 20% heavier under the NOPR
 - With GOES there's a lot of conversion to copper, which contributes to weight - supply chain issues.
 - 250 kVA and higher – difficult/impossible to design to meet NOPR requirements. DOE has not fully taken weight into consideration.
 - Supply: if we move to 100% amorphous the supply chain will flip. Equipment is completely different for amorphous.

- Aaron Meyers of Eaton provided information on test results for 3-phase MV liquid transformers
 - Observations
 - GOES increases 50% in weight
 - Amorphous increases 5% in weight
 - Sound levels are 5% higher with amorphous than GOES
 - With amorphous – greater flux density in the 3rd harmonic which leads to losses
- Colby Lovins of Federal Pacific presented information for LV dry-type transformers
 - Single-phase weight will increase 250%
 - Aluminum will go to copper from aluminum.
 - Stacked cores replaces by wound
 - GOES replaced by amorphous; if we stayed with GOES have to go to highest grade
- Joe Tedesco of Hitachi Energy presented test results for MV dry-type transformers
 - The pain for this class isn't as acute because DOE decided to only push up to EL 2
 - In most cases, GOES will be sufficient but it will need to be highest grade of GOES
 - For 15kV – aluminum is nearly impossible above 4250 kVA
- Brian Marquardt presented findings on behalf of Cleveland-Cliffs
 - Electrical steel very small footprint in terms of overall product
 - Grain-oriented is 80% of electrical steels production
 - It will be very costly for Cleveland Cliffs to switch to producing amorphous steel
- Dan Mulkey, User issues
 - For the proposed NOPR, DOE has based their regulations on prior loading studies; but they do not take into account loading changes
 - EIA has projected a 35% load increase in electric power by 2050
 - As an example, the load on single-phase transformers will increase due to electric heating requirements in CA

A representative of Hitachi Metglas was in the audience and provided some information on that company

- Now owned by Bain, which owns Proterial (in Japan) but Proterial's CEO is located in US
- Metglas has manufacturing in Conway, SC where they make some cores but mostly ribbon. Actual core making, including shaping and epoxy casting is done in a separate site.
- Metglas will be able to more than triple capacity for US by 45,00 tons and possibly to 70,000 tons of ribbon capacity by 2027, which is far below the total replacement of GOES in amounts > 200,000 metric tons.
- Nothing was stated about core fabrication production that also must reach similar levels to the ribbon.
- Our conclusion is that Amorphous replacement of GOES could not happen as needed by 2027.

2. Adjourn

The meeting adjourned at 10:50am CT

| Task Force Members | | |
|--------------------|------------|--------------------------------|
| Last | First | Company |
| Ayers | Donald | Ayers Transformer Consulting |
| Blew | David | Retired |
| Britton | Jeffrey | Phenix Technologies |
| Brown | Darren | Howard Industries |
| Callsen | Thomas | Weldy-Lamont Associates |
| Di Biase | Antonio | Tempel |
| Elliott | William | AEP Swepco |
| John | John | Virginia Transformer |
| Kennedy | Sheldon | Niagara Transformer |
| King | Gary | Howard Industries |
| Levin | Alexsandr | Weidmann Electrical Technology |
| Lively | Pary | Tempel |
| Marquardt | Bryan | Cleveland-Cliffs |
| Montpool | Rhea | Schneider Electric |
| Mulkey | Daniel | Mulkey Engineering Inc. |
| Murphy | Jerry | Reedy Creek Energy Services |
| Parkinson | Dwight | Eaton |
| Pepe | Harry | Phenix Technologies |
| Prince | Jarrold | ERMCO |
| Rashid | Adnan | Measurement Canada |
| Shannon | Michael | Rea Magnet Wire |
| Shertukde | Hemchandra | University of Hartford |
| Shirasaka | Yukiyasu | Hitachi Ltd. |
| Shull | Stephen | BBC Electrical Services |
| Smith | Edward | H-H Family of Corporations |
| Spurlock | Mike | Spurlock Engineering Services |
| Tendulkar | Vijay | Eaton |
| Vartanian | John | National Grid |
| Verdell | Joshua | ERMCO |
| Wilks | Alan | Consultant |

PC57.167 – Guide for Monitoring Distribution Transformers – Gary Hoffman

Mike Thibault, for Gary Hoffman, reported on the status of PC57.167. The working group did not meet.

Report was that comment resolution should now be complete and the document is finishing up editorial review. The expectation is that the document should be published in the coming months.

██████ C57.12.35 – Bar Coding for Transformers and Regulators– Rhett Chrysler

Rhett Chrysler presented the following minutes from the working group meeting on March 21, 2023 at 1:45 p.m. with 33 in attendance. Rhett also noted that he would be applying for a PAR extension to allow time to complete the work.

1. Chair called the meeting to order at 1:45pm. Members introduced themselves with their affiliation.
2. Total attendance of 33 is listed below. 16 of 21 members present and quorum was verified (76%). 3 guests requested membership. Chair Report
 - a. PAR for revision of C57.12.35 approved on 6/13/19 with an expiration date of 12/31/2023. The current published document C57.12.35-2013 also expires 12/31/2023.
 - b. WG Chair submitted draft to MEC and was returned to Chair 3/21/23. Only minor editorial comments received.
3. Chair called for identification of essential patents pertaining to the work of this WG. None brought forward. Copyright policy presented. No issues identified.
4. Motion to approve meeting agenda (Jerry Murphy/Alan Wilkes). Approved unanimously.
5. Motion to approve Fall 2022 Charlotte meeting minutes (Steve Shull/Alan Wilkes). Approved unanimously.
6. Old Business
 - a. New manufacturer/repair facility code requests should be sent to the Dist Trans SC chair. Malia Zaman to research the procedure to update the list.
 - b. Motion (Jerry Murphy/Steve Shull) to revise Clause 4.2.2.1.1 as follows - *The manufacturer shall be identified with a unique two-digit character string which is available as an IEEE SA download.*¹ *Manufacturers not listed may apply to the Distribution Transformers Subcommittee Chair to be added.*² Motion passed with unanimous approval. Note, the actual footnote numbers in the document are 9 and 10 respectively.
 - c. WG Chair to include the updated list with the source material submitted to IEEE SA for publishing.
7. New Business
 - a. Chair to initiate the IEEE SA ballot on 3/21/2023.
 - b. Chair to submit 2 year PAR extension request after document goes to initial ballot.
8. Next meeting – Kansas City, MO October 22-26, 2023
9. Meeting adjourned at 2:30pm CDT.

Submitted by: Alan Traut, Secretary

Date: 03/21/2023

¹ Recommended manufacturer codes currently in use are available at <https://standards.ieee.org/downloads>.

² Distribution Transformers Subcommittee Chair contact information is available at <https://www.transformerscommittee.org/subcommittees/distributiontransfsc/>.

10.

Attendance:

| First Name | Last Name | Company or Affiliation | Role | First Name | Last Name | Company or Affiliation | Role |
|------------|-----------|--------------------------|--------|------------|-----------|-------------------------------|-----------|
| Rehan | Ali | Siemens Energy Inc | Guest | Tim | Menter | Lincoln Electric Systems | Guest |
| Alejandro | Ayada | Power Partners | Guest | Jerry | Murphy | Reedy Creek Energy Services | Member |
| Jared | Bates | Oncor Electric Delivery | Member | Dwight | Parkinson | EATON Corporation | Guest |
| Chris | Brown | SDG&E | Guest | Martin | Rave | ComEd | Guest |
| Darren | Brown | Howard Industries | Member | Robert | Reepe | Georgia Power Co. | Member |
| Rhett | Chrysler | ERMCO | Member | Mason | Rush | Central Moloney | Guest |
| Alex | Cochran | U.S.E. | Guest | Fernando | Salinas | Power Partners | Guest (R) |
| Craig | DeRouen | ERMCO | Guest | Alberto | Sandoval | Eaton Corp | Guest |
| Carlos | Gaytan | Prolec GE | Member | Hemchandra | Shertukde | University of Hartford | Guest (R) |
| Rafael | Grajeda | Eaton Corp | Guest | Stephen | Shull | BBC Electrical Services, Inc. | Member |
| Kenneth | Hampton | Baltimore Gas & Electric | Member | Ali | Syep | Comed | Guest (R) |
| Ramadan | Issack | American Electric Power | Member | Chris | Talbert | JST Power Equipment | Guest |
| Patrycja | Jaroszy | IEEE SA | Guest | Michael | Thibault | Pacific Gas & Electric | Member |
| Gary | King | Howard Industries | Member | Alan | Traut | Howard Industries | Member |
| Andrew | Larison | Hitachi ABB Power Grids | Member | Alan | Wilks | Consultant | Member |
| Alejandro | Macias | CenterPoint Energy | Member | Malia | Zaman | IEEE SA | Guest |
| Lee | Matthews | Howard Industries | Member | | | | |

Task Force Tank Touch Temperature – Bruce Webb

Bruce presented the following minutes from the task force meeting on Monday March 20, 2023, at 4:45 PM with forty-eight (48) in attendance. Nineteen (19) of them being one of our current Thirty (32) Members.

1. Call to Order
The meeting was called to order by the Chair (Bruce Webb) with Vice-Chair (Ali Ghafourian) and Secretary (Albert Sanchez) in attendance on Monday March 20, 2023, at 4:45 PM.
2. Welcome and Introduction
The Chair identified the meeting topic, welcomed the attendees.
3. Attendance and Contact Sheets
The Secretary (Albert Sanchez) distributed attendance sheets and the Chair requested that new attendees provide clear and legible email addresses to address the ongoing 123Signup platform issues. Twenty-four (24) attendees completed this request with nine (9) requesting membership and the remaining participating as guests.
4. Participant Behavior
The Chair displayed several slides identifying the IEEE Codes of Ethics & Conduct expectations and specifically asked the attendees to maintain responsible behavior during the meeting, to treat one another nicely and with respect, and to avoid injuring others reputation or employment. There was no opposition to the requirements or request.
5. Essential Patent Claims
There was a call for essential patent(s) by the Chair. There were none brought forward. The Chair announced if there was one to let the Chair, Vice Chair, or Secretary know. The IEEE essential patent claim slides and guidelines were shown to the TF attendees, and this was recorded by the Secretary.

6. Copyright Policy
The IEEE copyright slides and guidelines were shown to the TF attendees without further discussion, and this was recorded by the Secretary.
7. Quorum Check
A quorum of nineteen (19) Members was achieved from our roster of thirty (32) Members.
8. Approval of agenda
As this was the second meeting of the Distribution Transformer SC TF on Tank Touch Temperature, the meeting attendees were provided the Chair's proposed agenda for their consideration and approval. The agenda was approved without any opposition.
9. Review of TF Directive
To keep the TF meeting on track, Members and Guests were reminded of our Directive from the SC:

‘... the Task Force is to further investigate perceived safety concerns regarding tank touch temperatures for transformers that are accessible to the public by...
 - a. exploring input and feedback from outside resources and experts,
 - b. evaluating opportunities to specifically address such concerns, and
 - c. making recommendations to the SC for next steps, if any.’
10. Guest Presentation
Jean C. Hernandez-Mejia (Georgia Institute of Technology) “NEETRAC’s Project on Padmounted Tank Temperatures”
11. Old Business
Individual or Company situational conditions for any incidents or actions taken related to tank touch temperatures, and b) February 21st Brainstorming Session Recap
12. Next Steps
The Chair resolved to reach out to attendees via survey for potential ideas on how to address this concern prior to the next in-person meeting without attendee objection. Mr. Hernandez (Georgia Institute of Technology) to clarify naming and corroborate results on charts presented to the Task Force members and guests.
13. Next meeting--date and location

The Next meeting will be the **Fall 2023 Meeting Kansas City, MO, USA**
14. **Adjournment**

The meeting was adjourned by the Chair at 5:55 PM

Submitted by: Albert Sanchez

Date: March 30, 2023
 Attendance

| | Last Name | First (Given) Name | Company (Affiliation) |
|----|-----------------|--------------------|--------------------------------|
| 1 | Ali | Rehan | Siemens Energy, Inc. |
| 2 | Arteaga | Javier | Hitachi Energy |
| 3 | Ayala | Alex | Power Partners |
| 4 | Bates | Jared | Oncor Electric Delivery |
| 5 | Betancourt | Edwin | Siemens-Energy |
| 6 | Biggie | Kevin | Weidmann Electrical Technology |
| 7 | Brown | Darren | Howard Industries |
| 8 | Callsen | Thomas | Weldy Lamont |
| 9 | Castellanos | Juan | Prolec GE |
| 10 | Chakraborty | Arup | Delta Star Inc. |
| 11 | Chapa | Raymundo | WEG |
| 12 | Chisholm | Matthew | IFD Technologies |
| 13 | Coker | Anthony | M&I Materials |
| 14 | Cook | Michael | Dominion SC |
| 15 | Cruz Valdes | Juan Carlos | Prolec GE |
| 16 | Derouen | Craig | ERMCO |
| 17 | Duarte | Fernando | EPRI |
| 18 | Ghafourian | Ali | H-J Enterprises |
| 19 | Grandbois | Richard(Luke) | IFD Technologies |
| 20 | Hampton | Ken | BGE |
| 21 | Hernandez-Mejia | Jean | GT-NEETRAC |
| 22 | Hogg | Ryan | Bureau of Reclamation |
| 23 | Karl | Jakob | Cargill |
| 24 | Klaponski | Brian | Carte International Inc. |
| 25 | Kozer | Patrick | Northeast Transformer |
| 26 | Kozer | Gilbert | Northeast Transformer |
| 27 | Lucas | Tiffany | Prolec GE |
| 28 | Machain | Jose | Prolec GE |
| 29 | McKinney | Ken | VL Solutions |
| 30 | Menter | Tim | Lincoln Electric System |
| 31 | Murphy | Jerry | RCES |
| 32 | Nims | Joe | Allen & Hoshall |
| 33 | Parkinson | Dwight | Eaton |
| 34 | Plascencia | Miguel | PG&E |
| 35 | Reepe | Robert | GA Power Co. |
| 36 | Rush | Mason | Central Moloney Inc. |
| 37 | Sanchez | Albert | KUB |
| 38 | Sbravati | Alan | Hitachi Energy |
| 39 | Shull | Stephen | BBC Electrical Services |
| 40 | Smith | Ed | The H-J Family of Companies |
| 41 | Syep | Ali | ComEd |
| 42 | Thibault | Mike | PG&E |
| 43 | Tillery | Tim | Howard Industries |
| 44 | Tyler | Morgan | Duke Energy |
| 45 | Valentin | Reinaldo | Duke Energy |
| 46 | Verdell | Joshua | ERMCO |
| 47 | Walters | Shelby | Howard Industries |

| | | | |
|----|-------|-------|----------------|
| 48 | Webb | Bruce | KUB |
| 49 | Wilks | Alan | Consultant |
| 50 | Yang | Fei | Hitachi Energy |

C.3 Old Business

- No old business was discussed

C.4 New Business

Dan Mulkey brought up that throughout standards terminology regarding High/Low/Medium voltage was inconsistent. 12.80 has definitions but maybe they need to be reviewed. Recommended a Task Force be formed to make working for Primary/Secondary voltage consistent throughout standards. Dan Sauer commented that 12.80 was about to go to ballot.

San Sauer made a motion to form a PAR study group to review/revise C57.15. Steve Shull provided a 2nd and the motion was passed unanimously.

Motion was made by Steve Shull to apply for a PAR for C57.12.36 and C57.12.39 using the same scope and title. Motion was 2nd by Dan Mulkey and approved unanimously.

C.5 Chairman's Closing Remarks and Announcements

Jerry had no closing comments to the SC.

C.6 Adjournment

Jerry adjourned the meeting as provided in the meeting agenda at 10:44am.

List of Attendees and Affiliations:

| Last Name | First Name | Role | Company |
|------------------|-------------------|-------------|--------------------------------------|
| Ali | Rehan | Guest | Siemens Energy |
| Almeida | Nabi | Member | Prolec GE |
| Arteaga | Javier | Member | Hitachi Energy |
| Ayala | Alex | Guest | Power Partners |
| Ayers | Donald | Member | Ayers Transformer Consulting |
| Bates | Jared | Member | Oncor Electric Delivery |
| Biggie | Kevin | Member | Weidmann Electrical Technology |
| Blaszczuk | Piotr | Guest | Specialty Transformer Components LLC |
| Blew | David | Member | Retired (PSE&G) |
| Britton | Jeffrey | Guest | Phenix Technologies, Inc. |
| Brown | Darren | Member | Howard Industries |
| Callsen | Thomas | Member | Weldy-Lamont Associates |
| Chisholm | John | Member | IFD Corporation |
| Chrysler | Rhett | Member | ERMCO |
| Colopy | Craig | Member | Retired (Eaton) |
| Dauzat | Thomas | Member | AEP Swepco |
| DeRouen | Craig | Guest | ERMCO |
| Di Biase | Antonio | Guest | Tempel |
| Dulac | Hakim | Member | Advanced Power Technologies |
| Dutta Roy | Samragani | Member | Siemens Energy |
| Ferreira | Marcos | Member | Engineering Consultation Services |
| Frimpong | George | Guest | Hitachi Energy |
| Garcia | Benjamin | Guest | Southern California Edison |
| Gardner | James | Member | Prolec GE - Waukesha |
| Gaytan | Carlos | Member | Prolec GE |
| Ghafourian | Ali | Member | H-J Enterprises, Inc. |
| Ghosh | Rob | Member | General Electric |
| Gonzales | Michael | Guest | Southern California Edison |
| Gonzalez | Luis | Guest | Conduct Industries Limited |
| Grabdbois | Richard | Guest | IFD Technologies |
| Gross | Detlev | Guest | Power Diagnostix Consult GmbH |
| Gyore | Attila | Guest | M&I Materials Ltd |
| Hampton | Kenneth | Member | Baltimore Gas & Electric |
| Heiden | Kyle | Member | EATON Corporation |
| Hernandez Cano | Sergio | Member | Hammond Power Solutions |
| Hoffman | Saramma | Guest | PPL Electric Utilities |
| Hogg | Ryan | Guest | Bureau of Reclamation |
| Hopkinson | Philip | Member | HVOLT Inc. |
| Issack | Ramadan | Member | American Electric Power |
| John | John | Member | Virginia Transformer Corp. |
| King | Gary | Member | Howard Industries |
| Klaponski | Brian | Member | Carte International Inc. |
| Lachman | Mark | Guest | Doble Engineering Co. |

| | | | |
|-----------|------------|-----------|--------------------------------|
| Larison | Andrew | Member | Hitachi Energy |
| Lee | Moonhee | Member | Hammond Power Solutions |
| Levin | Aleksandr | Guest | Weidmann Electrical Technology |
| Li | Weijun | Member | Braintree Electric Light Dept. |
| Lively | Parry | Guest | Tempel |
| Macias | Alejandro | Member | CenterPoint Energy |
| Mai | Tim-Felix | Member | Siemens Energy |
| Matthews | Lee | Member | Howard Industries |
| McBride | James | Guest | JMX Services, Inc. |
| McBride | Brian | Member | Cargill, Inc. |
| Menter | Timothy | Guest | Lincoln Electric System |
| Miller | Kent | Member | T&R Electric Supply Co. |
| Minikel | Justin | Guest | EATON Corporation |
| Montpool | Rhea | Member | Schneider Electric |
| Mulkey | Daniel | Member | Mulkey Engineering Inc. |
| Murphy | Jerry | Chair | Reedy Creek Energy Services |
| Narawane | Aniruddha | Guest | EATON Corporation |
| Oakes | Stephen | Member | WEG Transformers USA Inc. |
| Parkinson | Dwight | Member | EATON Corporation |
| Patel | Vinay | Guest | Consolidated Edison Co. of NY |
| Payerle | George | Guest | Carte |
| Pepe | Harry | Guest | Phenix Technologies, Inc. |
| Prince | Jarrold | Member | ERMCO |
| Radu | Ion | Member | Hitachi Energy |
| Rashid | Adnan | Guest | Measurement Canada / ISED |
| Rave | Martin | Secretary | ComEd |
| Reepe | Robert | Member | Georgia Power Co. |
| Riordan | Kevin | Guest | WEG Transformers USA Inc. |
| Ronchi | Rodrigo | Guest | WEG-Voltran |
| Rush | Mason | Guest | Central Moloney, Inc. |
| Salinas | Fernando | Guest | Power Partners |
| Sanchez | Albert | Member | Knoxville Utilities Board |
| Sauer | Daniel | Member | EATON Corporation |
| Sawant | Anil | Guest | Virginia Transformer Corp. |
| Schindler | Stefan | Member | Maschinenfabrik Reinhausen |
| Schwartz | Dan | Guest | Quality Switch, Inc. |
| Selvaraj | Pugal | Member | Virginia Transformer Corp. |
| Shalabi | Jaber | Guest | VanTran Industries, Inc. |
| Shertukde | Hemchandra | Member | University of Hartford |
| Shingari | Avijit | Member | Pepco Holdings Inc. |
| Shull | Stephen | Member | BBC Electrical Services, Inc. |
| Simons | Andre | Guest | JFE Shoji |
| Snyder | Steven | Member | Hitachi Energy |
| Spaulding | James | Guest | Fort Collins Utilities |
| Stank | Markus | Member | Maschinenfabrik Reinhausen |

Annex C

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|--------------|----------|------------|--|
| Stankes | David | Guest | 3M |
| Stretch | Kerwin | Member | Siemens Energy |
| Szczechowski | Janusz | Member | Maschinenfabrik Reinhausen |
| Taylor | Marc | Guest | JFE Shoji Power Canada Inc. |
| Tendulkar | Vijay | Member | EATON (Power Distribution, Inc. (PDI)) |
| Thibault | Michael | Member | Pacific Gas & Electric |
| Tillery | Timothy | Member | Howard Industries |
| Traut | Alan | Member | Howard Industries |
| Vartanian | John | Member | National Grid |
| Verdell | Joshua | Vice-Chair | ERMCO |
| Vyas | Pragnesh | Member | Sunbelt-Solomon |
| Washburn | Alan | Guest | Burns & McDonnell |
| Webb | Bruce | Member | Knoxville Utilities Board |
| Weiss | Zachery | Member | WEG Transformers USA Inc. |
| Whitehead | William | Guest | H2scan Corporation |
| Williams | Trenton | Member | Advanced Power Technologies |
| Yun | Joshua | Member | Virginia Transformer Corp. |
| Zanwar | Anand | Guest | Siemens Energy |
| Zarnowski | Michael | Member | Carte International |
| McKinney | Ken | Guest | UL Solutions |
| Grooms | Brad | Guest | NTS |
| Fu | Renji | Guest | ERMCO |
| Duaxte | Fernando | Guest | EPRI |
| Tatu | Valerie | Guest | Powersmiths |
| Plascencia | Miguel | Guest | PG&E |
| Castro | Fidel | Guest | SDGE |
| Gupta | Ravi | Guest | Megger |
| Garcia | Miguel | Guest | Hitachi Energy |
| White | Elliot | Guest | SD Myers |
| Dugan | Roger | Guest | EPRI |
| Chisholm | Matthew | Guest | IFD Technologies |
| Moreno | Andre | Guest | Siemens Energy |
| Kelly | Joe | Guest | TCI Sales |
| Talbert | Chris | Guest | JST Power Equipment |
| Lambert | Jason | Guest | JST Power Equipment |
| Nunn | Tommy | Guest | JST Power Equipment |
| Hall | Michael | Guest | Mid Central Electric |
| Viereck | Karsten | Guest | Reinhausen Germany |
| Tarango | Erik | Guest | Olson |
| Cho | Eunyoung | Guest | Hico - America |
| Wirte | Kevin | Guest | Cargill, Inc. |
| Craven | Michael | Guest | Qualus Power Services |
| Khan | Dasim | Guest | Neetrac - Georgia Tech |
| Jarosz | Patrycja | Guest | IEEE SA |
| Naja | Ismael | Guest | Eaton |

Annex C

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|----------|-------------|-------|-----------------------------|
| Alahmed | Alex | Guest | Evergy |
| Da Silva | Roberto | Guest | Cargill |
| Yuan | Guang | Guest | Hitachi Energy |
| Brown | Chris | Guest | SDGE |
| Munoz | Martin | Guest | Orto de Mexico |
| Kham | Qasim | Guest | Neetrac - Georgia Tech |
| Sullivan | Christopher | Guest | Westmark Partners |
| Coughlan | William | Guest | Metglas |
| Panesar | Parminder | Guest | Virgina/Georgia Transformer |
| Mihir | Amin | Guest | Eaton Copr |
| Syed | Ali | Guest | Comed |
| Ansari | Tauhid | Guest | Hitachi Energy |
| Elnimri | Qusai | Guest | Vantran Industries |
| Ali | Rehan | Guest | Siemens Energy |