

Annex C Distribution Subcommittee – Chair: Ed Smith

November 17, 2021

Virtual

Chair: Ed Smith

Vice-Chair: Jerry Murphy

Secretary: Josh Verdell

C.1 General Opening

Ed opened the meeting welcoming everyone to the meeting. To establish a quorum, a list of members was displayed, and a quorum poll was made. We did have a quorum with 50 members in attendance by count of those identified on a slide presented in the meeting. Recorded attendance gave 148 in attendance and 53 members. List of attendees and affiliation attached below.

The agenda was reviewed, a motion was made to approve by Marcos Ferreira, seconded by Gary Hoffman, and approved by unanimous acclamation of the members in attendance.

The Spring 2021 meeting minutes were reviewed, a motion was made to approve by Gary Hoffman, seconded by Marcos Ferreira, 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 November 15, 2021 at 10:50 a.m. with 61 in attendance.

1. Call to order
The meeting was called to order by the Chair (Al Traut) at 10:50AM CST on Monday, November 15, 2021.
2. Confirmation of the essential patent statement and responses
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.
3. Quorum Verification
A members list was displayed, and members were asked to complete digital poll. **33 of 54** members were present. A Quorum was declared. Attendance is recorded below.

*4 guests requesting membership. All meet attendance requirements and will be added as members during the next meeting.

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 prior to the meeting for review. Minutes were approved without any opposition.

6. Chair Report
The Chair announced the active PAR expires in 2023.

7. Old Business

No old business

8. New Business
 - a. Discussion: Annex B regarding Cover Dielectric Testing
 - i. Al Traut presented photos from Howard Industries during preliminary testing using new fixture/method
 - ii. Steve Shull noted that the photos shown did not include bushings on a finish unit. Al pointed out this test would most likely be done as quality control by manufacturers to ensure no issues before units may be finished
 - b. Discussion: Annex B Table B.1
 - i. Steve reminds the group that notes included within the table are "informative" and can easily be changed. Notes outside of the table become part of the document
 - ii. Al questions the intent for the 10kV test voltage for the 1.0" clearance area for 2400/4160Y. Josh Verdell who helped create the chart suggests changing the clearance to 2.5". Steve agrees. No vote necessary.
 - c. Discussion: Annex B Section B.2.4
 - i. Al questions the 3 minute duration of the test. Bruce Webb of KUB states his requirement, "Covers shall have a minimum electrical withstand rating of 8 kV, 60 Hz for one (1) minute without failure."
 - d. Discussion: Adding "120" secondary rating to the standard
 - i. Tables that would need to be modified: 2, 7, and 9
 - ii. Al and Kendrick will work on a draft to be presented in the next meeting

9. Next meeting--date and location

The Next meeting will be the **2022 Spring: March 27 – 31, 2022; Denver (Hyatt Regency, Conv. Center), Colorado USA**

10. Adjournment

The meeting was adjourned at 11:39 AM CST

Submitted by: Kendrick Hamilton

Date: 15/11/2021

C57.12.20 WG Meeting Attendance
Fall 2021 On-line

Role	First Name	Last Name	Company
Guest	Rehan	Ali	Siemens Energy
Member	Jerry	Allen	Metglas, Inc.
Member	Angela	Amador	EATON Corporation
Member	Glenn	Andersen	Fayetteville PWC
Guest	Gregory	Ante	Southern California Edison
Guest	Edmundo	Arevalo	Bonneville Power Administration
Guest	Kevin	Biggie	Weidmann Electrical Technology
Member	Darren	Brown	Howard Industries
Member	John	Chisholm	IFD Corporation
Member	Rhett	Chrysler	ERMCO
Guest	Craig	Colopy	EATON Corporation
Member	Michael	Dahlke	Central Moloney, Inc.
Member	Benjamin	Garcia	Southern California Edison
Guest	James	Gardner	SPX Transformer Solutions, Inc.
Member	Carlos	Gaytan	Prolec GE
Member	Ali	Ghafourian	H-J Enterprises, Inc.
Guest	Michael	Gonzales	Southern California Edison
Member	Said	Hachichi	Hydro-Quebec
Secretary	Kendrick	Hamilton	Power Partners, Inc.
Member	Kenneth	Hampton	Baltimore Gas & Electric
Member	Ramadan	Issack	American Electric Power
Member	Gael	Kennedy	GR Kennedy & Associates LLC
Guest	Evan	Knapp	EATON Corporation
Guest	Andrew	Larison	Hitachi Energy
Guest	Rosamise	Magee	PSE&G
Guest	Jinesh	Malde	M&I Materials Inc.
Guest	Zachary	Millard	Great River Energy
Guest	Philip	Miller	Memphis Light, Gas & Water
Guest	Manoj Kumar	Mishra	ASAssoft (Canada) Inc
Member	Michael	Morgan	Duke Energy
Guest	Martin	Munoz Molina	Orto de Mexico
Member	Dwight	Parkinson	EATON Corporation
Guest	Chris	Pitts	Howard Industries
Member	Jarrold	Prince	ERMCO
Guest	Lesther Alex	Quispe Cuadrado	EATON Corporation
Guest	Ion	Radu	Hitachi Energy
Member	Juan	Ramirez	CELECO
Member	Martin	Rave	ComEd
Guest	Robert	Reepe	Georgia Power Co.
Guest	Mahesh	Sampat	EMS Consulting Inc.
Guest	Albert	Sanchez	Knoxville Utilities Board
Guest	Alan	Sbravati	Cargill, Inc.
Guest	Jeffrey	Schneider	Power Partners/Spire Power Solutions

Guest	Avijit	Shingari	Pepco Holdings Inc.
Member	Stephen	Shull	BBC Electrical Services, Inc.
Member	Audrey	Siebert-Timmer	IFD Corporation
Guest	Adrian	Silgardo	IFD Corporation
Member	Igor	Simonov	Toronto Hydro
Vice-Chair	Edward	Smith	H-J Family of Companies
Guest	Kerwin	Stretch	Siemens Energy
Member	Eric	Theisen	Metglas, Inc.
Member	Michael	Thibault	Pacific Gas & Electric
Guest	Timothy	Tillery	Howard Industries
Chair	Alan	Traut	Howard Industries
Member	Reinaldo	Valentin	Duke Energy
Member	Jeremy	Van Horn	IFD Corporation
Member	John	Vartanian	National Grid
Member	Joshua	Verdell	ERMCO
Guest	Shelby	Walters	Howard Industries
Member	Bruce	Webb	Knoxville Utilities Board
Member	Alan	Wilks	Consultant

██████ 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 November 16, 2021 at 8:00 a.m. in with 79 in attendance.

1. Dan Mulkey called the meeting to order at 8:00 AM CST.
2. Opening remarks and announcements
 - a. None were made
3. Dan Mulkey reviewed IEEE SA Copyright Policy and Essential Patent Claims. No issues were raised.
4. Membership changes were noted:
 - a. Added: Chris Guertin, Andrew Larison, Jeff Schneider, Avjit Shingari
 - b. Changed to Guest: none
5. Quorum was verified. The working group consisted of **59** members, requiring **30** for quorum. **39** members were confirmed through the WebEx poll. Attendance records later confirmed **49** members.
6. Dan Mulkey requested approval of the agenda. Jerry Murphy made a motion, second by Steve Shull. Agenda was unanimously approved.
7. Dan Mulkey requested approval of the 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: in progress, draft 1.4
 - 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: in progress, draft 1.4
 - 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 and noted that we have three meetings left to finish C57.12.28 and C57.12.29.
 - b. Taskforce Report: Stainless Steel Definitions
 - i. **Taskforce Members: Will Elliot, Tiffany Lucas.**
 - ii. Dan Mulkey informed the group that proposed stainless steel definitions are now included into an annex as per the approved motion from the last meeting.
 - c. Taskforce Report: Special Pad-mount Tests (pry-bar, wire probe)
 - i. **Taskforce Members: Gary King, Shelby Walters, Michael Zarnowski.**
 - ii. Concluded Snap-On torque wrench in Annex B is still available. Iron Man scales No. 1756T4 are no longer available but there are substitutions (i.e. Chatillon DG-200, No 118 Detecto Matic). Plunger springs are still available from MW Components however Figure B-3 needs to be modified to reflect the supplier datasheet.
 - iii. **Gary King made a motion to change Fig B-3 to match supplier datasheet (including changing the free length to 2.5 inches and along with changing units to lbf). Second by Marty Rave. Motion was unanimously approved.**
 - iv. **Dan Mulkey to propose wording next meeting to reference a generic spring sale rather than an Iron Man scale.**
 - d. Taskforce Report: Coating Adhesion Test Methods
 - i. **Taskforce Members: Justin Minikel (chair), Jane Hall, Chris Guertin, Martin Bachand, Scott Abbott, Zoran Goncin.**
 - ii. Taskforce reviewed two primary test methods: tape adhesion and pull-off adhesion. Knife adhesion was mentioned briefly but the group concluded this test method was too subjective.

- iii. Taskforce recommended to the group to keep existing tape adhesion test method as-is and adding a tape adhesion test after humidity exposure.
 - iv. Group discussed humidity exposure test.
 - 1. It was suggested to add a time limit (i.e. tape adhesion test to be performed X hours after humidity exposure)
 - 2. It was discussed that scratching the surface may change paint hardness and improve adhesion which may impact test results.
 - 3. It was mentioned that many other standards do adhesion tests after environmental exposure.
 - 4. It was suggested that humidity adhesion tests should be performed before adding this requirement to the standard.
 - 5. Jane Hall offered to perform a blind test on samples after humidity exposure from different manufacturers. This test would give us general idea on how various coating perform.
 - 6. Test variables were discussed including substrate preparation, substrate material and coating type / cure time. One suggestion was to use ATC test panels to reduce test variabilities.
 - 7. A comment was made that coating performance should be the same regardless of type or application method.
 - v. **Taskforce to continue discussion and present proposed test plan to group at next meeting.**
- e. Taskforce Report: C57.12.38 Request on Tank Touch Temperatures
- i. **Taskforce Members: Jerry Murphy (chair), Steve Shull, Dan Mulkey, Jeremy Van Horn, Justin Minikel, Jane Hall, Chris Geuterin, Scott Abbott.**
 - ii. Taskforce concluded that coating temperature limits far exceed transformer operating temperatures.
 - iii. The group then discussed safety implications of external transformer temperatures (specifically for pad mounted transformers)
 - 1. ASTM C1055 standard state that surface temperatures of 40.5°C are a hazard.
 - 2. Under standard operating conditions external tank temperatures will be way above 40°C (this does not include radiant heat from the sun).
 - 3. Discussed that as this is a human and environmental safety issue it should be captured in the standards somewhere.
 - 4. Tank surface temperature also impacts decal adhesion and corrosion rates.
 - 5. One suggestion was to include this safety warning in the 12.00 standard.
 - 6. A comment was made that the wire pry and probe test is directly related to safety.
 - 7. A comment was made that high temperature insulating fluids have other benefits like fire mitigation during a fault and are not necessarily used to increase transformer loading alone.
 - 8. A comment was made that DER penetration will also impact external tank temperatures.
 - 9. Group discussed possible mitigation methods including increasing the transformer size or the installation of guarding or fencing systems.

- iv. **Taskforce to continue discussion and develop wording that can be used in the standard to inform users and manufacturers of this safety risk along with options for mitigating this risk. If anybody is interested in contributing, please contact Jerry Murphy.**
 - f. Discussion continued from S21 meeting: Substrate Surface Preparation
 - i. Tom Dauzat brought forward that surface cleaning for stainless steel cannot use carbon grit as it will impregnate the material resulting in pitting corrosion. Manufactures must only use glass or sand for surface preparation of stainless steels.
 - ii. Tom Dauzat commented that this requirement already exists in some industry standards.
 - iii. Group discussed and agreed that this should be included in the annex of the standard.
 - iv. **Dan Mulkey requested a taskforce to draft up wording summarizing substrate preparation requirements that can be included in the annex.**
 - v. **Taskforce Members: Tom Dauzat (chair), Martin Bachand, Jane Hall and Zoran Goncin.**
10. New business:
- a. No new business was discussed
1. C57.12.28 and C57.12.29 continued revision
- a. Dan Mulkey briefly showed the changes proposed in draft 1.4. All changes are summarized in meeting slides which will be posted on the website. Review of these changes will be the focus for the Spring 2022 meeting.
2. Next meeting: is planned for March 29, 2022, in Denver, Colorado USA
- a. The following attendees requested membership and will be added to membership for the Spring 2021 meeting: **Jane Hall, Robert Reepe.**
3. The meeting was adjourned at 9:14 AM CST.

Submitted by: Audrey Siebert-Timmer

Date: 11/16/2021

List of Members:

Scott Abbott (PPG)

Glenn Andersen (Fayetteville PWC)

Martin Bachand (Cloverdale Paint Inc.)

Darren Brown (Howard Industries)

Thomas Callsen (Weldy-Lamont Associates)

John Chisholm (IFD Corporation)

Rhett Chrysler (ERMCO)

Michael Dahlke (Central Moloney, Inc.)

Thomas Dauzat (General Electric)

William Elliott (Prolec GE)

Benjamin Garcia (Southern California Edison)

James Gardner (SPX Transformer Solutions, Inc.)

Carlos Gaytan (Prolec GE)

Ali Ghafourian (H-J Enterprises, Inc.)

Chris Guertin (Cloverdale Paint Inc.)

Said Hachichi (Hydro-Quebec)

Kenneth Hampton (Baltimore Gas & Electric)
Ramadan Issack (American Electric Power)
Gael Kennedy (GR Kennedy & Associates LLC)
Gary King (Howard Industries)
Brad Kittrell (Consolidated Edison Co. of NY)
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)
Ion Radu (Hitachi Energy)
Juan Ramirez (CELECO)
James Ratty (Electronic Technology Inc.)

Martin Rave (ComEd)
Pedro Salgado (Electronic Technology Inc.)
Jeffrey Schneider (Power Partners/Spire Power Solutions)
Avijit Shingari (Pepco Holdings Inc.)
Stephen Shull (BBC Electrical Services, Inc.)
Audrey Siebert-Timmer (IFD Corporation)
Igor Simonov (Toronto Hydro)
Edward Smith (H-J Family of Companies)
Travis Spoone (EATON Corporation)
Michael Thibault (Pacific Gas & Electric)
Alan Traut (Howard Industries)
Reinaldo Valentin (Duke Energy)
Jeremy Van Horn (IFD Corporation)
John Vartanian (National Grid)
Joshua Verdell (ERMCO)
Shelby Walters (Howard Industries)
Alan Wilks (Consultant)

List of Guests:

Rehan Ali (Siemens Energy)
Jerry Allen (Metglas, Inc.)
Gregory Ante (Southern California Edison)
Huan Dinh (Hitachi Energy)
Jeffrey Door (H-J Family of Companies)
Zoran Goncin (PTI Transformers)
Michael Gonzales (Southern California Edison)
Jane Hall (Cloverdale Paint Inc.)
Colby Lovins (Federal Pacific)
Tiffany Lucas, P.E. (SPX Transformer Solutions, Inc.)
Rosamise Magee (PSE&G)
Timothy Menter (Lincoln Electric System)

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

Scott Dahlke, for Steve Shull, presented the following minutes from the working group meeting on November 15, 2021 at 2:20 p.m. with 33 in attendance.

Scott brought the motion from the working group to move the current draft of the standard to ballot. This was seconded by Alan Wilks. The Subcommittee voted with 44 for, 12 abstentions, and 0 against. The motion to move the standard to ballot was passed.

1. The Chair called the meeting to order at 2:20 P.M. CST on November 15, 2021. A Poll was taken to identify WG members and guests. A quorum was established.
2. Agenda approval

The Chair displayed the Agenda for this meeting. The Chair asked for any changes or additions to the displayed Agenda. Hearing none, the Chair declared the Agenda approved as shown.

3. Minutes approval

The Chair commented that the Meeting Minutes of the last meeting were posted on the Transformer Committee website. The Chair asked for any additions or modifications to the Meeting Minutes. Hearing none, the Chair declared the minutes approved as posted.

4. Confirmation of IEEE SA Essential Patent Statement

The patent information request was displayed to the working group and 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.

5. 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.

6. Old Business

Clause 7.2 - Dielectric tests

The Chair displayed the existing clause. He stated the current wording has been in this standard for many years. Since the PAR extension will be ending in 2022 and this clause would take significant research and discussion to change, the Chair approached the commentor with these concerns. The commentor agreed it would be best to leave Clause to a later revision. The Chair asked the WG for any objections on leaving Clause 7.2 unchanged in this current version. There were no objections to this.

7. New Business

The Chair asked the group if this document was ready for ballot? Jerry Murphy made a motion to “Move the current draft revision 2.8 of PC57.12.34 to Ballot”. The motion was seconded by Martin Rave. In discussion of the motion, the question was asked if an editorial review had been done on the current draft. The Chair stated that the editorial issues will be brought out on comments from the ballot resolution as well during the Mandatory Editorial Coordination (MEC) review. The Chair stated that a 2/3 majority vote of the present WG members would be required. The motion passed unanimously. The Chair stated due his needing to report in the Bushing Subcommittee, he would ask Scott Dahlke to report for the Working Group and state the motion for ballot to the Distribution Subcommittee.

8. The meeting adjourned at 2:38 P.M. CST.

Submitted by: Scott Dahlke.

Date: 11/16/2021

Attendance:

NAME	Affiliation	M or G
Aaron Meyers	Eaton	Guest

Name	Affiliation	M or G
Igor Simonov	Toronto Hydro	Member

Name	Affiliation	M or G
Michael Zarnowski	Carte	Guest

Alan Sbravati	Cargill	Guest
Alan Traut	Howard Industries	Member
Alan Wilks	Wilks Consulting	Member
Albert Sanchez	Knoxville Utilities Board	Guest
Alejandro Macias	CenterPoint Energy	Member
Ali Ghafourian	H-J Enterprises, Inc.	Member
Andrew Larison	Hitachi Energy	Guest
Audrey Siebert-Timmer	IFD Corp.	Member
Avijit Shingari	PEPCO Holdings	Guest
Ben Garcia	Southern California Edison	Member
Brian Klaponski	Carte	Member
Bruce Webb	Knoxville Utilities Board	Member
Carlos Gaytan	Prolec GE	Member
Dan Mulkey	Mulkey Engineering	Member
Dwight Parkinson	Eaton	Member
Edmundo Arevalo	Boonville Power Administration	Guest
Eric Theisen	Metglas	Member
Gael Kennedy	GR Kennedy & Associates LLC	Member
Gary King	Howard Industries	Member
Glenn Andersen	Fayetteville PWC	Guest
Greg Ante	Southern California Edison	Guest

James Edward Smith	H-J Enterprises, Inc.	Member
Jeff Schneider	Spire Power	Member
Jeremy Van Horn	IFD Corp.	Member
Jerry Allen	Metglas	Member
Jerry Murphy	Reedy Creek Energy Services	Member
John Vartanian	National Grid	Member
Josh Verdell	ERMCO	Guest
Joshua Yun	Virginia Transformer Corp.	Member
Juan Ramirez	Celeco	Member
Kayland Adams	SPX Transformers	Guest
Ken Hampton	BGE	Member
Kendrick Hamilton	Power Partners	Guest
Kent Miller	T&R Electric Supply Co.	Guest
Kevin Rapp	Cargill	Guest
Kyle Zemanovic	Eaton	Guest
Malia Zaman	IEEE SA	Guest
Manoj Mishra	ASAssoft Canada	Guest
Markus Stank	Reinhausen	Guest
Martin Rave	ComEd	Member
Michael Gonzales	Southern California Edison	Guest
Michael S. Dahlke	Central Moloney, Inc.	Member

Mike Thibault	Pacific Gas & Electric	Member
Paul Chisholm	IFD Corp.	Member
Philip Miller	Memphis LGW	Guest
Rajkumar Padmawar	ASAssoft Canada	Guest
Ramadan A Issack	American Electric Power	Guest
Rehan Ali	Siemens-Energy	Guest
Rhea Montpool	Schneider Electric	Member
Rhett Chrysler	ERMCO	Member
Rob Ghosh	General Electric	Guest
Robert Reepe	Southern Co.	Guest
Rosamise Magee	PSE&G	Guest
Said Hachichi	Hydo Quebec	Member
Stephen Shull	BBC Electrical Services, Inc.	Member
Steve Schappell	SPX Transformers	Member
Thomas Callsen	Weldy-Lamont Associates	Member
Tim Tillery	Howard Industries	Guest
Weijun Li	Braintree Elec. Light Dept.	Member
Zachery Weiss	WEG Transformers USA Inc.	Guest

C57.12.36 – Distribution Substation Transformers – Jerry Murphy

This working group did not meet.

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

Marty Rave, for Ali Ghafourian, presented the following minutes from the working group meeting on November 15, 2021 at 12:55 p.m. with 57 in attendance.

1. Call to order, Verification of Quorum, and Chair’s remarks

The virtual meeting was called to order by the Chair, Ali Ghafourian, at 12:55 p.m. CDT on Monday November 15th, 2021.

Quorum was established with 29 out of 57 Working Group members present per poll results generated. Actual Member attendance was 36 per Attendees spreadsheet (Attendees.xlsx) provided by ENCORE rep at end of meeting.

The Chair announced the active PAR expires at the end of 2021, and a two-year PAR extension through the end of 2023 was requested and is awaiting approval.

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

The essential Patent presentation slides were shown. Then, the Chair called for Patents amongst the Working Group in which there was none that were brought forward to the Chair. Also, the Copyright presentation slides were shown as required.

3. Approval of agenda

The agenda was issued to the Working Group prior to the meeting for review. The agenda was unanimously approved.

4. Approval of minutes of previous meeting

The Spring 2021 meeting minutes (S21-C57.12.38-UnapprovedMinutesR3.pdf) were posted to the Distribution Subcommittee website after the meeting for the Working Group members to review. The Spring 2021 meeting minutes were unanimously approved.

5. Draft review

The latest draft, D2.5 (C57 12 38 D2.5 Sept 2021(Comments).pdf), of proposed revisions to C57.12.38 was reviewed with the Working Group. A review will be performed of the notes for the tables/figures of the proposed Draft to determine whether the notes should be included inside the table (informative) or outside the table (normative). No figures or sketches of the accessories described in Annex A will be included due to potential copyright issues. Section A.2.3 of Annex A – “Bay-O-Net” may need to be removed and changed to “Bayonet” due to copyright (Jerry Murphy) and Section A.9 – Remove reference to Drain Valve NPT size due to different sizes readily available (Ali Ghafourian). Also, Jeff Schneider asked if the WG is considering adding Fault Indicators within Annex A. This was noted to be reviewed for possible inclusion into Annex A in the next draft revision. The latest draft, D2.5, will be revised based on the comments noted during the meeting and then posted to the Distribution Subcommittee website for Working Group to review. A special Working Group meeting will be scheduled prior to the Spring 2022 meeting to vote on a motion (requiring a 2/3 majority for approval) for submitting the latest draft document to the Subcommittee for approval to go to ballot.

6. Old Business

Jeremy Van Horn reported for the Tank Touch Temperature Task Force stating the issue of tank touch temperature is being considered for inclusion by the Enclosure Integrity Working Group, but no final decision has been reached as to which Working Group is most appropriate to address this issue.

7. New Business

No new business items were raised during the meeting.

8. Next meeting – Date and Location

The Chair announced the Working Group will meet at the Spring 2022 meeting in Denver, CO (USA) or by Webex Virtual meeting.
Dates: March 27th – 31st, 2022

9. Adjournment

The Chair adjourned the meeting at approximately 1:45 p.m. CDT.

List of Attendees and Affiliations:

1	Ali Ghafourian (Chair)	H-J Enterprises, Inc.	Member
2	Martin Rave (Vice-Chair)	ComEd	Member
3	Jarrod Prince (Secretary)	ERMCO	Member
4	Jerry Allen	Metglas, Inc.	Member
5	Angela Amador**	EATON Corporation	Member
6	John Chisholm	IFD Corporation	Member
7	Michael Dahlke	Central Moloney, Inc.	Member
8	Benjamin Garcia**	Southern California Edison	Member
9	Carlos Gaytan	Prolec GE	Member
10	Said Hachichi	Hydro-Quebec	Member
11	Kenneth Hampton	Baltimore Gas & Electric	Member
12	Ramadan Issack	American Electric Power	Member
13	Gael Kennedy	GR Kennedy & Associates LLC	Member
14	Andrew Larison**	Hitachi Energy	Member
15	Alejandro Macias**	CenterPoint Energy	Member
16	Kent Miller	T&R Electric Supply Co.	Member
17	Michael Morgan	Duke Energy	Member
18	Daniel Mulkey	Mulkey Engineering Inc.	Member
19	Jerry Murphy	Reedy Creek Energy Services	Member
20	Dwight Parkinson	EATON Corporation	Member
21	Chris Pitts	Howard Industries	Member
22	Juan Ramirez	CELECO	Member
23	Avijit Shingari**	Pepco Holdings Inc.	Member
24	Stephen Shull	BBC Electrical Services, Inc.	Member
25	Igor Simonov	Toronto Hydro	Member
26	Edward Smith	H-J Family of Companies	Member
27	Markus Stank	Maschinenfabrik Reinhausen	Member
28	Eric Theisen	Metglas, Inc.	Member
29	Michael Thibault	Pacific Gas & Electric	Member
30	Reinaldo Valentin	Duke Energy	Member
31	Jeremy Van Horn	IFD Corporation	Member
32	John Vartanian	National Grid	Member
33	Joshua Verdell	ERMCO	Member
34	Shelby Walters	Howard Industries	Member
35	Bruce Webb	Knoxville Utilities Board	Member
36	Alan Wilks	Consultant	Member
37	Rehan Ali	Siemens Energy	Guest
38	Glenn Andersen	Fayetteville PWC	Guest
39	Gregory Ante	Southern California Edison	Guest
40	Jared Bates	Oncor Electric Delivery	Guest
41	Rhett Chrysler	ERMCO	Guest
42	Michael Gonzales	Southern California Edison	Guest
43	David Holland	ExxonMobil	Guest
44	Rosamisa Magee	PSE&G	Guest
45	Terence Martin	MarVen	Guest
46	Manoj Kumar Mishra	ASAsoft (Canada) Inc	Guest
47	Martin Munoz Molina	Orto de Mexico	Guest
48	Lesther Alex Quispe Cuadrado*	EATON Corporation	Guest
49	Robert Reepe*	Georgia Power Co.	Guest
50	Mahesh Sampat	EMS Consulting Inc.	Guest

51	Albert Sanchez	Knoxville Utilities Board	Guest
52	Jeffrey Schneider	Power Partners/Spire Power Solutions	Guest
53	Adrian Silgado	IFD Corporation	Guest
54	Katrina Swanson McLeod	Southern Nuclear	Guest
55	Timothy Tillery	Howard Industries	Guest
56	Christopher Whitten	Hitachi Energy	Guest
57	Malia Zaman	IEEE	Guest

** 6 New Members were introduced to the Working Group. 1 of the 6 didn't attend this meeting.
 * A total of 2 guests requested Working Group membership which will be reviewed to determine who is eligible for membership before the Spring 2022 meeting.

██████ 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 November 15, 2021 at 9:25 a.m. After the minutes were presented there was some open discussion on the topic of transformer design/loading. Phil Hopkinson mentioned that recent material inflation/scarcity should be considered in the upcoming DOE work. Brian Klaponski brought up the increase in loads due to electric vehicles. Marty Rave brought up that further increases to transformer sizes due to increase efficiency requirements will be prohibitive for current installations.

1. Call to order and any Chair's remarks

- 9:10 am meeting was called to order

2. Quorum Verification

- Not a working group; Quorum is not necessary. 155 were in attendance for this meeting.

3. Confirmation of the essential patent statement and responses

- Not a working group, no patents were discussed.

4. Approval of minutes of the previous meeting

- Minutes approved.

5. Approval of agenda for this meeting.

- Agenda was posted and followed for this meeting.

6. Technical Topic

a. Phil Hopkinson introduction

Phil Hopkinson noted that the final DOE Energy Conservation Program: Test Procedure for Distribution Transformers has been issued. There is also a Template Form that goes with the final test procedure. Effective January 2022 one will need to submit your compliance data on the appropriate form.

b. DOE Revised Final Testing Requirements for 2021

Embedded below are the Federal Register announcement Test Procedure for Distribution Transformers and the Template Form that goes with the final test procedure.

c. DOE Preliminary NOPR on Mandatory Efficiencies – Jeremy Dommu

Jeremy Dommu of DOE Building Technologies Program reported on Preliminary Analysis for Distribution Transformers. On September 29, 2021 DOE completed rulemaking. The output: What the per unit load should be to rate load of transformers. DOE has reopened the comment period through December 10, 2021. NEMA is working on a response. EEI is working on a response. Mr. Dommu stressed that stakeholder input is an important part of the process.

d. Mahesh Sampat on NREL Forecasted loading

Mahesh Sampat presented on history, future, and impact of 2050 Electrification to utilities and liquid filled distribution transformers and “Net zero” by 2050

- **Usage of Electricity has leveled off since 2005**
- **Per Capita usage of electricity has been going down since 2005**
 - Shift in economy plus efficiency improvements
- **To reach *NetZero* CO2 emission by 2050, significant Electrification of US economy is expected**
 - Transportations
 - Building -Space Heating and Cooling Technology, etc.
- **Per NREL Electrification Report**
 - Demand for Electricity will be 20% higher under Medium scenario & 38% higher under High scenario over reference (BAU)
- **Per Unit Load (PUL) on transformers can go up**
 - *Without local solar*, up to 0.12 -0.38 in medium scenario & up to 0.138 -0.44 in high scenario
 - Local Solar (DPV) Production will lower above PULs
- **Impact on Electric Utility will be *very positive* in any of above scenarios**
 - However, Hydrogen for transportation could be a competing technology

Discussion: EV – long trips at fill in station will yield a new addition to the grid and fast charging will need stiffer system. Roof top PV will reduce grid-supplied electricity. Steve Rosenstock commented the report is a national overview, but it should be noted that certain wildcard states (California, NY) are being very aggressive.

e. Dan Mulkey on Knoxville Loading

Dan Mulkey presented on transformer loading in Knoxville, TN. Measured data from smart meters. Data started with Bruce Webb. 129,955 customers. Full Presentation embedded above. May revisit next time as time was running short.

7. Documents

All documents from this meeting will be posted on the IEEE Distribution Transformers Subcommittee website

8. Adjourn

No additional comments before adjournment at 10:35am EDT.

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

Gary presented the following minutes from the working group meeting on November 16, 2021 at 4:45 p.m. with 60 in attendance.

1. Call to order and Chair's remarks – Called to Order at 3:45PM CST by Gary Hoffman
2. Chairs Remarks (Item #6 in Agenda)
3. Quorum Verification – Took count with 35 members attending – Quorum Met with 60 total in attendance
4. Discussion over those asking for membership requested to identify themselves in the Chat for the Webex – These members will be contacted post meeting to verify attendance of prior meetings.
5. Approval of Agenda - Item #3 for this meeting. No Objections
6. Approval of the meeting of Spring 2021 – Item #4 - Motion by Jerry Murphy 2nd by Hakim Dulac – Unanimous Approval – No Objections
7. Call for Patents and IEEE SA Copywrite Policy Statements Made – No Items brought to the Chairs attention
8. Task Force Reports was presented as follows:
 - Clause 4: Dan Mulkey discussed changes – No issues objected to – no motions made
 - Clause 5: Jerry Murphy - Key Monitoring – Direct Fiber Low Voltage Hot Spot Monitoring to be added to Table – Hakim Dulac made Motion – Seconded by Roger Felton – Motion carried unanimously. Jerry to speak to Brad Stayley with Salt River Project on specifics.
 - Clause 6: Method of alert, and Telemetry- Thibault/Shull discussed – No issues objected to – no motions made
 - Clause 7: Installation – Under construction – more work needed - discussion by Gary Hoffman (Chair)
9. New Business a. Agreement and Discussion concerning “Straw Poll” to be present Clause 4,5,6 to STNP and Distribution Transformer Subcommittees for comment in an attempt to uncover and potentially address any comments these members may have with the Working Groups product (Monitoring Guide) to date.
10. Next meeting is in Denver, Co March 27th thru 31st 2022
11. Adjournment

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

Rhett Chrysler presented the following minutes from the working group meeting on November 16, 2021 at 12:55 p.m. with 29 in attendance.

1. Chair called the meeting to order at 12:55pm CDT.
2. Total attendance of 29 is listed below. 14 of 23 members present and quorum was verified (61%). 2 guests requested membership.
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. Approved unanimously.
5. Motion to approve Spring 2021 (Virtual) meeting minutes by Ken Hampton, 2nd by Dan Mulkey. Approved unanimously.
6. 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 also expires 12/31/2023.
 - b. WG goal is to vote to move the document to ballot at the Fall 2022 meeting.
7. Old Business
 - a. Follow up to the TF on editorial review, Rhett will update Figure 7 by the next meeting to show vertical location of the temporary barcode label.
 - b. At the Spring 2021 meeting a request was made for a new manufacturer code ‘NS’ from Gilbert Kozer of Northeast Transformer Services. At this meeting another request was made by Andre Lainson9?? for Hitachi Energy. Rhett reported that any changes to the manufacturer code list will be balloted along with this standard.
 - c. TF Report on QR Code – Rhett Chrysler, Israel Barrientos and Mike Thibault Israel. Rhett presented the results of the QR code survey. A summary follows:
 - i. 30 responses received, 13 end user, 17 manufacturer
 - ii. QR code technology trickling into manufacturing practices but with limited consistency and/or overlap of uses
 - iii. 32 of 55 selections (58%) preferred information referenced in existing C57.12.35 data requirements
 - iv. 20 of 55 selections (36%) preferred information referenced in C57.12.37 data requirements
 - v. 26 of 30 (87%) of respondents supported inclusion as a standard reference for QR code minimum requirements in the C57.12.35 standard
 - d. A new QR code TF formed (Mike Thibault (chair), Steve Shull, Ken Hampton, Rhett Chrysler, Pragnesh Vyas, Alex Macias) to draft a new informative Annex for QR code on the temporary label.
8. New Business - None

9. Next meeting March 29, 2022 Denver, CO

10. Meeting adjourned at 2:10pm CDT.

Submitted by: Alan Traut, Secretary

Date: 11/16/2021

Attendance:

First Name	Last Name	Company	Role
Glenn	Andersen	Fayetteville PWC	M
Darren	Brown	Howard Industries	M
Rhett	Chrysler	ERMCO	M
Ben	Garcia	Southern California Edison	G
Kenneth	Hampton	Baltimore Gas & Electric	M
Ramadan	Issack	American Electric Power	M
Andrew	Larison	Hitachi ABB Power Grids	G*
Alejandro	Macias	CenterPoint Energy	M
Lee	Matthews	Howard Industries	M
Kent	Miller	Consultant	G
Tyler	Morgan	Duke Energy	G
Dan	Mulkey	Mulkey Engineering	M
Jerry	Murphy	Reedy Creek Energy Services	M
Dwight	Parkinson	EATON Corporation	G
Chris	Pitts	Howard Industries	G
Martin	Rave	ComEd	G
Robert	Reepe	Georgia Power Co.	G*
Albert	Sanchez	Knoxville Utilities Board	G
Avijit	Shingari	Pepco Holdings Inc.	M
Stephen	Shull	BBC Electrical Services, Inc.	M
Adrian	Silgado	IFD Corporation	G
Edward	Smith	H-J Family of Companies	M
Michael	Thibault	Pacific Gas & Electric	M
Alan	Traut	Howard Industries	M
Reinaldo	Valentin	Duke Energy	G
Joshua	Verdell	ERMCO	G
Pragnesh	Vyas	Solomon Corp	G
Shelby	Walters	Howard Industries	G
Alan	Wilks	Consultant	G

G* Requesting Membership

C.3 Old Business

- No old business was discussed

C.4 New Business

Brian Klaponski brought up that the next meeting needed to have published Covid protocols before companies would be comfortable sending reps to the meeting. Bruce Forsyth noted that the message was heard.

C.5 Chairman's Closing Remarks and Announcements

Ed had no closing comments to the SC.

C.6 Adjournment

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

List of Attendees and Affiliations:

Role	First Name	Last Name	Company
Guest	Rehan	Ali	Siemens Energy
Guest	Nabi	Almeida	Prolec GE
Guest	Glenn	Andersen	Fayetteville PWC
Guest	Gregory	Ante	Southern California Edison
Guest	Edmundo	Arevalo	Bonneville Power Administration
Member	Javier	Arteaga	Hitachi Energy
Member	Donald	Ayers	Ayers Transformer Consulting
Guest	Gilles	Bargone	FISO Technologies Inc.
Member	Israel	Barrientos	Prolec GE
Guest	Jared	Bates	Oncor Electric Delivery
Guest	Duvier	Bedoya	Hitachi Energy
Guest	Tammy	Behrens	SPX Transformer Solutions, Inc.
Guest	Kevin	Biggie	Weidmann Electrical Technology
Guest	Dominique	Bolliger, Ph.D.	HV TECHNOLOGIES, Inc.
Guest	Jeffrey	Britton	Phenix Technologies, Inc.
Member	Darren	Brown	Howard Industries
Guest	Jagdish	Burde	Virginia Transformer Corp
Member	Thomas	Callsen	Weldy-Lamont Associates
Guest	Kurt	Carlson	V&F Transformer
Member	John	Chisholm	IFD Corporation
Member	Rhett	Chrysler	ERMCO
Member	Craig	Colopy	EATON Corporation
Guest	John	Crouse	Roswell Alliance
Guest	Jorge	Cruz	PTI Transformers
Guest	Michael	Dahlke	Central Moloney, Inc.
Member	Thomas	Dauzat	General Electric
Guest	Eric	Davis	Burns & McDonnell
Guest	Larry	Dix	Quality Switch, Inc.
Guest	Hakim	Dulac	Qualitrol Company LLC
Member	Samraghi	Dutta Roy	Siemens Energy
Guest	William	Elliott	Prolec GE
Guest	Reto	Fausch	RF Solutions
Member	Marcos	Ferreira	Beale AFB
Guest	Bruce	Forsyth	Bruce Forsyth and Associates PLLC
Guest	George	Frimpong	Hitachi Energy
Guest	Lorne	Gara	Shermco
Guest	Benjamin	Garcia	Southern California Edison
Member	James	Gardner	SPX Transformer Solutions, Inc.
Member	Carlos	Gaytan	Prolec GE
Member	Ali	Ghafourian	H-J Enterprises, Inc.
Guest	Rob	Ghosh	General Electric
Guest	Andrea	Glynn	Xcel Energy
Guest	Zoran	Goncin	PTI Transformers

Guest	Michael	Gonzales	Southern California Edison
Guest	Jose Antonio	Gonzalez Ceballos	Georgia Transformer
Member	James	Graham	Weidmann Electrical Technology
Member	Said	Hachichi	Hydro-Quebec
Guest	Kendrick	Hamilton	Power Partners, Inc.
Guest	Kenneth	Hampton	Baltimore Gas & Electric
Guest	Giovanni	Hernandez	Virginia Transformer Corp.
Member	Sergio	Hernandez Cano	Hammond Power Solutions
Guest	John	Herron	Raytech USA
Member	Gary	Hoffman	Advanced Power Technologies
Guest	Saramma	Hoffman	PPL Electric Utilities
Guest	Ryan	Hogg	Bureau of Reclamation
Guest	David	Holland	ExxonMobil
Member	Philip	Hopkinson	HVOLT Inc.
Member	John	John	Virginia Transformer Corp.
Member	Gael	Kennedy	GR Kennedy & Associates LLC
Member	Gary	King	Howard Industries
Member	Brian	Klaponski	Carte International Inc.
Guest	Alexander	Kraetge	OMICRON electronics
Guest	Michelle	Kutzleb	TJH2b Analytical Services
Guest	Andrew	Larison	Hitachi Energy
Guest	Moonhee	Lee	Hammond Power Solutions
Guest	Aleksandr	Levin	Weidmann Electrical Technology
Member	Weijun	Li	Braintree Electric Light Dept.
Guest	Xose	Lopez-Fernandez	Universidade de Vigo
Guest	Colby	Lovins	Federal Pacific
Member	Alejandro	Macias	CenterPoint Energy
Member	Tim-Felix	Mai	Siemens Energy
Guest	Jinesh	Malde	M&I Materials Inc.
Member	Lee	Matthews	Howard Industries
Guest	James	McBride	JMX Services, Inc.
Guest	Timothy	Menter	Lincoln Electric System
Guest	Aaron	Meyers	EATON Corporation
Member	Kent	Miller	T&R Electric Supply Co.
Guest	Manoj Kumar	Mishra	ASAssoft (Canada) Inc
Member	Rhea	Montpool	Schneider Electric
Member	Daniel	Mulkey	Mulkey Engineering Inc.
Vice-Chair	Jerry	Murphy	Reedy Creek Energy Services
Guest	Ali	Naderian	METSCO Energy Solutions Inc.
Guest	Frank	Neder	Trench Germany GmbH
Guest	Kristopher	Neild	Megger
Guest	Stephen	Oakes	WEG Transformers USA Inc.
Guest	Rodrigo	Ocon	Industrias IEM
Guest	Rajkumar	Padmawar	ASAssoft (Canada) Inc
Member	Dwight	Parkinson	EATON Corporation

Annex C

Guest	Harry	Pepe	Phenix Technologies, Inc.
Guest	Caroline	Peterson	Xcel Energy
Guest	Matthew	Pinard	Weidmann Electrical Technology
Guest	Chris	Powell	Intermountain Electronics
Member	Jarrold	Prince	ERMCO
Guest	Jimmy	Rasco	Rasco Consulting LLC
Member	Martin	Rave	ComEd
Guest	Samuel	Reed	EATON Corporation
Guest	Scott	Reed	MVA
Guest	Robert	Reepe	Georgia Power Co.
Guest	Afshin	Rezaei-Zare	York University
Guest	Josue	Rodriguez	Prolec GE
Guest	Leopoldo	Rodriguez	Transformer Testing Services LLC
Guest	Hakan	Sahin	Virginia/Georgia Transformer
Guest	Pedro	Salgado	Electronic Technology Inc.
Guest	Mahesh	Sampat	EMS Consulting Inc.
Guest	Albert	Sanchez	Knoxville Utilities Board
Guest	Manish	Saraf	Hammond Power Solutions
Member	Daniel	Sauer	EATON Corporation
Guest	Alan	Sbravati	Cargill, Inc.
Guest	Stefan	Schindler	Maschinenfabrik Reinhausen
Member	Jeffrey	Schneider	Power Partners/Spire Power Solutions
Guest	Dan	Schwartz	Quality Switch, Inc.
Guest	Pugal	Selvaraj	Virginia Transformer Corp.
Guest	Jeremy	Sewell	Quality Switch, Inc.
Guest	Samuel	Sharpless	Rimkus Consulting Group
Member	Hemchandra	Shertukde	University of Hartford
Guest	Avijit	Shingari	Pepco Holdings Inc.
Member	Adrian	Silgado	IFD Corporation
Member	Igor	Simonov	Toronto Hydro
Guest	Jonathan	Sinclair	PPL Electric Utilities
Guest	Christopher	Slattery	FirstEnergy Corp.
Chair	Edward	Smith	H-J Family of Companies
Guest	Mike	Spurlock	Spurlock Engineering Services, LLC
Guest	Markus	Stank	Maschinenfabrik Reinhausen
Guest	Kerwin	Stretch	Siemens Energy
Member	Janusz	Szczechowski	Maschinenfabrik Reinhausen
Guest	Marc	Taylor	JFE Shoji Power Canada Inc.
Guest	Dervis	Tekin	Meramec Instrument Transformer Co.
Guest	Eric	Theisen	Metglas, Inc.
Member	Michael	Thibault	Pacific Gas & Electric
Member	Timothy	Tillery	Howard Industries
Guest	Mark	Tostrud	Dynamic Ratings, Inc.
Member	Alan	Traut	Howard Industries
Member	Jeremy	Van Horn	IFD Corporation

Guest	John	Vartanian	National Grid
Secretary	Joshua	Verdell	ERMCO
Member	Rogerio	Verdolin	Verdolin Solutions Inc.
Member	Pragnesh	Vyas	Sunbelt-Solomon Solutions
Member	Sukhdev	Walia	New Energy Power Co.
Guest	Alan	Washburn	Burns & McDonnell
Member	Bruce	Webb	Knoxville Utilities Board
Member	Alan	Wilks	Consultant
Guest	Trenton	Williams	Advanced Power Technologies
Member	Baitun	Yang	R.E. Uptegraff
Member	Joshua	Yun	Virginia Transformer Corp.
Guest	Malia	Zaman	IEEE
Guest	Anand	Zanwar	Siemens Energy
Guest	Michael	Zarnowski	Carte International
Guest	Kyle	Zemanovic	EATON Corporation