

## **Annex C Distribution Subcommittee – Chair: Ed Smith**

**April 28, 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 52 members in attendance by count of those identified on a slide presented in the meeting. Recorded attendance gave 150 in attendance and 51 members. List of attendees and affiliation attached below.

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

The Fall 2020 meeting minutes were reviewed, a motion was made to approve by John John, seconded by Phil Hopkinson, 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**

#### **C.2.1 C57.12.20 – Overhead Distribution Transformers – Al Traut**

Al presented the following minutes from the working group meeting on April 26, 2021 at 11:45 a.m. with 55 in attendance.

1. Call to order  
The meeting was called to order by the Chair (Al Traut) at 10:45AM on Monday, April 26, 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. 28 of **53** members were present. A Quorum was declared. Attendance for this meeting is included below.
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

a. Discussion: Section 7.5.1 Covers

- i. Motion: Dan Mulkey motions to remove the wording “preferred” from “Annex B describes a preferred method...”. Steve Shull seconds. 25 of the 27 members present voted “For”. Motion passes.

b. Discussion: Table 6 – Electrical characteristics of bushings

- i. Comments: Steve Shull brought to attention of the working group that C57.19.02 group will discuss topic further in tomorrow’s 4/27/21 meeting

c. Discussion: Dielectric Strength of Covers

- i. Question: from Thomas Dauzat regarding 25kV Dielectric strength of covers
- ii. Comments: All references Appendix B which gives informative material that is not required. There is currently no standard.

8. New Business

No new business

9. Next meeting--date and location

The Next meeting will be the **2021 Fall: March 22 – 26; Milwaukee, Wisconsin, USA**

10. Adjournment

**The meeting was adjourned at 12:22 PM**

Submitted by: Kendrick Hamilton

Date: 26/04/2021

C57.12.20 WG Meeting Attendance  
Spring 2021 On-line  
April 26, 2021

	Role	First Name	Last Name	Company
1	Guest(R)	Angela	Amador	EATON Corporation
2	Guest	Gregory	Ante	Southern California Edison
3	Guest	Kevin	Biggie	Weidmann Electrical Technology
4	Member	Darren	Brown	Howard Industries
5	Member	Rhett	Chrysler	ERMCO
6	Member	Michael	Dahlke	Central Moloney, Inc.
7	Guest	Thomas	Dauzat	General Electric
8	Guest(R)	Benjamin	Garcia	Southern California Edison
9	Guest	James	Gardner	SPX Transformer Solutions, Inc.
10	Member	Carlos	Gaytan	Prolec GE
11	Member	Ali	Ghafourian	H-J Enterprises, Inc.
12	Member	Said	Hachichi	Hydro-Quebec
13	Secretary	Kendrick	Hamilton	Power Partners, Inc.
14	Member	Kenneth	Hampton	Baltimore Gas & Electric
15	Guest	David	Holland	ExxonMobil
16	Member	Ramadan	Issack	American Electric Power
17	Guest	Kristin	James	Eaton
18	Member	Gael	Kennedy	GR Kennedy & Associates LLC
19	Guest	Andrew	Larison	Hitachi ABB Power Grids
20	Guest	Christopher	Lianides	Southern California Edison
21	Guest	Justin	Minikel	EATON Corporation
22	Member	Michael	Morgan	Duke Energy
23	Member	Daniel	Mulkey	Mulkey Engineering Inc.
24	Guest	Martin	Munoz Molina	Orto de Mexico
25	Member	Dwight	Parkinson	EATON Corporation
26	Member	Jarrold	Prince	ERMCO
27	Member	Juan	Ramirez	CELECO
28	Guest(R)	Kevin	Rapp	Cargill, Inc.
29	Member	Martin	Rave	ComEd
30	Guest	Robert	Reepe	Georgia Power Co.
31	Guest(R)	Afshin	Rezaei-Zare	York University
32	Guest	Albert	Sanchez	Knoxville Utilities Board
33	Guest	Stefan	Schindler	Maschinenfabrik Reinhausen
34	Guest	Jeffrey	Schneider	Power Partners/Spire Power Solutions
35	Guest	Avijit	Shingari	Pepco Holdings Inc.
36	Member	Stephen	Shull	BBC Electrical Services, Inc.
37	Member	Audrey	Siebert-Timmer	IFD Corporation
38	Member	Igor	Simonov	Toronto Hydro
39	Vice-Chair	Edward	Smith	H-J Family of Companies
40	Guest(R)	Markus	Stank	Maschinenfabrik Reinhausen
41	Guest	Christopher	Sullivan	Westmark Partners
42	Guest	Radoslaw	Szewczyk	Specialty Products Poland Sp. z o.o.
43	Member	Eric	Theisen	Metglas, Inc.
44	Member	Michael	Thibault	Pacific Gas & Electric
45	Guest	Timothy	Tillery	Howard Industries
46	Chair	Alan	Traut	Howard Industries
47	Member	Jeremy	Van Horn	IFD Corporation
48	Guest(R)	John	Vartanian	National Grid
49	Member	Joshua	Verdell	ERMCO
50	Guest	Rogério	Verdolin	Verdolin Solutions Inc.
51	Guest	Duy	Vo	Central Maine Power (AVANGRID)
52	Member	Pragnesh	Vyas	Sunbelt-Solomon Solutions
53	Guest	Shelby	Walters	Howard Industries
54	Member	Bruce	Webb	Knoxville Utilities Board
55	Member	Alan	Wilks	Consultant

Guest(R) = Guest requesting membership

## **C.2.2 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 April 27, 2021 at 8:00 a.m. in with 68 in attendance.

1. Dan Mulkey called the meeting to order at 8:01 AM CST.
2. Opening remarks and announcements
  - a. Dan Mulkey commented that the group has a request from the C57.12.38 1-ph pad group which will be discussed in new business.
3. Dan Mulkey reviewed IEEE SA Copyright Policy and Essential Patent Claims. No issues were raised.
4. Membership changes were noted:
  - a. Added: Ramadan Issack
  - b. Changed to Guest: Anil Dhawan, Lee Welch and Bill Wimmer
  - c. It was brought up that Donnie Trivett will no longer be attending meetings and will be removed from roster.
5. Quorum was verified. The working group consisted of **56** members, requiring **28** for quorum. **37** members were confirmed through the WebEx poll. **43** members confirmed afterwards through attendance records.
6. Dan Mulkey requested approval of the agenda. Jerry Murphy made a motion, seconded by Steve Shull, for approval of the agenda. Agenda was unanimously approved.
7. Dan Mulkey requested approval of the minutes. Marty Rave made a motion, seconded by Al Traut 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 1.3**
  - 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 1.3**
  - 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 updated the group on C57.12.30
    - i. Standard was approved as a revised standard by the IEEE SA Standards Board on Dec 3, 2020 and published March 4, 2021.
  - b. Dan Mulkey updated the group on C57.12.31
    - i. Standard was approved as a revised standard by the IEEE SA Standards Board on Dec 3, 2020 and published February 26, 2021.
  - c. Dan Mulkey reviewed status of standards, next up is revising and updating the C57.12.28 and C57.12.29.
  - d. Taskforce Report: Stainless Steel Definitions
    - i. The task force of Will Elliott & Tiffany Lucas on steel definitions prepared proposed definitions for carbon steel, copper bearing steel and AISI 304, 304L, 316 316L, 409 stainless steels as well as a table summarizing national stainless-steel standards. These were displayed for discussion.
    - ii. Dan Mulkey reminded the group that in the pad-mount standards the only term used is carbon steel. This term was defined using an out-of-print black book in the pole-mounted standards.
    - iii. Zoran Goncin commented that any copper steel can be copper bearing as it is related to copper content.
    - iv. Tiffany Lucas commented proposed definitions reflect copper steel as having < 0.6% copper and copper bearing steel having 0.2% minimum copper with specified minimum yield strength.
    - v. Justin Minikel commented that these definitions may work better if they were included in the SNTP Taskforce Corrosion Effects work.
    - vi. Will Elliot agreed but commented that the timing / next steps for this Taskforce is undefined at the moment.
    - vii. Dan Mulkey proposed the group should include the definitions and references as an informative annex for now. We can review the annex again before the standard goes out to ballot.
    - viii. Jerry Murphy made a motion, second by Marty Rave to include an informative annex in C57.12.28 and C57.12.29 that provides a short description of commonly used transformer steels and references national steel standards.
      - 1. Ali Ghafourian asked if there was any ASTM reference number for carbon steel. Will Elliot commented there may be an SAE reference.
      - 2. Jerry Murphy commented that A36 is the ASTM reference. ASTM also has a A568 for rolled steel.
      - 3. Dan asked if there were any objections to the motion. Hearing none the **motion passed unanimously.**
  - e. Taskforce Request: Special Pad-mount Tests (pry-bar, wire probe)

- i. Dan Mulkey requested a taskforce to be formed to review the special security tests in C57.12.28 / .29 (pry-bar, wire probe, etc.) to confirm special parts are available and if not specify a substitute (i.e. referenced Iron Man scales No. 1756T4 seem to be obsolete).
  - ii. **Taskforce Members: Gary King, Shelby Walters, Michael Zarnowski, Carlos Gaytan, Zoran Goncin**
- f. Coating Tests Discussion: continued from Fall 2020 meeting
  - i. Dan Mulkey reviewed list of people that volunteered in the Fall 2020 meeting to run tests including: Jane Hall and Chris Guertin from Cloverdale Paint, Scott Abbott from PPG, Brian Klaponski from Carte International Inc and Carlos Gaytan from Prolec GE.
  - ii. Dan Mulkey asked if anyone else would like to volunteer to run coating tests. Josh Verdell from ERMCO volunteered.
  - iii. Dan Mulkey asked the group what kind of tests should we consider performing / evaluating.
  - iv. Discussion on Corrosion Tests
    - 1. Justin Minikel commented that a NEETRAC project was recently approved which will evaluate corrosion test methods including the SCAB test. Project findings will be presented to this group once complete.
    - 2. Jane Hall commented we should consider running corrosion tests depending on the expected environment. For example, ISO 12944 has different tests for different environments.
    - 3. Justin commented that will be addressed in the NEETRAC project.
    - 4. Jerry Murphy asked if adhesion and pitting tests will be included in the NEETRAC project. Justin Minikel stated that they are not.
  - v. Discussion on Adhesion Tests
    - 1. Jane Hall suggested we run pull-off adhesion tests and compare results to the current tape test method.
    - 2. Justin Minikel agreed but commented equipment costs are high for pull-off tests.
    - 3. Zoran Goncin commented the current tape test method is very practical / provide good results.
    - 4. Justin Minikel agreed, but commented there are lots of factors that come into play.
    - 5. Dan Mulkey requested a taskforce to be formed to evaluate coating adhesion test methods.
    - 6. **Taskforce Members: Justin Minikel (chair), Jane Hall, Chris Guertin, Zoran Goncin, Scott Abbot**
- g. C57.12.28 and C57.12.29 Revision
  - i. Justin Minikel converted both standards into the new IEEE template and redline text with previous approved changes from C57.12.30 / 31 / 32. Drafts 1.3 of each are posted on the web page.
  - ii. Dan Mulkey reviewed recommended changes to the Scope and Purpose for both these documents which differ from what is on the approved PAR.
  - iii. Al Traut made a motion, second by Ben Garcia to accept recommended scope and purpose changes. Motion passed unanimously.
  - iv. **Review of C57.12.28/.29 Draft 1.3 will be continued next meeting.**

## 10. New business:

- a. SCAB Testing Clarification Request
  - i. Between meetings, Lestrade George of Protech Power in Saint-Laurent, Quebec, Canada had submitted a request through IEEE liaison to clarify SCAB procedure.
  - ii. Dan Mulkey proposed to modify Annex A to make the prescribed week equal to one cycle, and in 5.4.6 adjust the “15 cycles” to “3 week-long cycles”.
  - iii. Dan Mulkey presented options to change 15 cycles, and clarifying wording in Annex A Monday
  - iv. Justin Minikel asked if we needed to update 31 with a corrigendum. After some discussion this was tabled.
  - v. Justin Minikel made a motion, second by Jerry Murphy to accept the proposed changes to Annex A. **The motion passed unanimously.**
- b. C57.12.38 Request: Tank Touch Temperatures Cautionary Note
  - i. Dan Mulkey asked the group if we should consider adding a cautionary note about tank touch temperatures to the enclosure integrity standards. Should we also consider adding tests to verify coatings can withstand these temperatures?
  - ii. Jane Hall commented Cloverdale has performed temperature gradient tests on coatings.
  - iii. Justin Minikel commented that failure criteria will need to be clearly defined if we run coating temperature tests.
  - iv. Scott Abbott asked what types of temperatures are we concerned with. Elevated temperatures from sunlight or elevated operating temperatures or both? Dan Mulkey responded both.
  - v. Gary King commented there are two components we need to define
    - 1. Maximum allowable tank touch temperature
    - 2. Integrity of coating at these temperatures
  - vi. Dan requested a taskforce to be formed to look at tank touch temperatures and maximum allowable coating temperatures.
  - vii. **Taskforce Members: Jerry Murphy (chair), Steve Shull, Dan Mulkey, Jeremy Van Horn, Justin Minikel, Jane Hall, Chris Geuterin, Scott Abbott**
- c. Substrate Surface Preparation
  - i. Tom Dauzat brought up surface preparation on stainless, carbon and polymer material prior to coatings like SSPC-SP6
  - ii. **This discussion was tabled and will be continued next meeting.**

## 11. Next meeting: is planned for October 18, 2021 in Milwaukee, Wisconsin USA

- a. The following attendees requested membership and will be added to membership for the Fall 2021 meeting: Chris Guertin, Andrew Larison, Jeff Schneider, Avijit Shingari

## 12. The meeting was adjourned at 9:18 AM CST.

Submitted by: Audrey Siebert-Timmer

Date: 05/04/2021

**List of Members:**

*Scott Abbott (PPG)*  
*Martin Bachand (Cloverdale Paint Inc.)*  
*Darren Brown (Howard Industries)*  
*John Chisholm (IFD Corporation)*  
*Rhett Chrysler (ERMCO)*  
*Douglas Craig (Richards Manufacturing Co.)*  
*Michael Dahlke (Central Moloney, Inc.)*  
*Thomas Dauzat (General Electric)*  
*William Elliott (General Electric)*  
*Benjamin Garcia (Southern California Edison)*  
*James Gardner (SPX Transformer Solutions, Inc.)*  
*Carlos Gaytan (Prolec GE)*  
*Ali Ghafourian (H-J Enterprises, 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)*  
*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 ABB Power Grids)*  
*Juan Ramirez (CELECO)*  
*James Ratty (Electronic Technology Inc.)*  
*Martin Rave (ComEd)*  
*Pedro Salgado (Electronic Technology Inc.)*  
*Stephen Shull (BBC Electrical Services, Inc.)*  
*Audrey Siebert-Timmer (IFD Corporation)*  
*Igor Simonov (Toronto Hydro)*  
*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)*  
*Jeremy Van Horn (IFD Corporation)*  
*John Vartanian (National Grid)*  
*Joshua Verdell (ERMCO)*  
*Shelby Walters (Howard Industries)*  
*Alan Wilks (Consultant)*



**List of Guests:**

*Gregory Ante (Southern California Edison)*  
*Paul Gabriel Florida (Howard Industries, Inc.)*  
*Zoran Goncin (PTI Transformers)*  
*Chris Guertin (Cloverdale Paint Inc.)*  
*Jane Hall (Cloverdale Paint Inc.)*  
*Kristin James (Eaton)*  
*Andrew Larison (Hitachi ABB Power Grids)*  
*Christopher Lianides (Southern California Edison)*  
*Tiffany Lucas (SPX Transformer Solutions, Inc.)*  
*Kent Miller (T&R Electric Supply Co.)*  
*Nitesh Patel (Hyundai Power Transformers USA)*  
*Vinay Patel (Consolidated Edison Co. of NY)*  
*Chris Pitts (Howard Industries)*  
*Robert Reepe (Georgia Power Co.)*  
*Albert Sanchez (Knoxville Utilities Board)*  
*Jeffrey Schneider (Power Partners/Spire Power Solutions)*  
*Jeremy Sewell (Quality Switch, Inc.)*  
*Jaber Shalabi (VanTran Industries, Inc.)*  
*Avijit Shingari (Pepco Holdings Inc.)*  
*Kunal Shukla (PECO Energy Company)*  
*Adrian Silgado (IFD Corporation)*  
*Christopher Sullivan (Westmark Partners)*

**C.2.3 C57.12.34 – Three Phase Pad-Mount Transformers – Steve Shull**

Jerry Murphy, for Steve Shull, presented the following minutes from the working group meeting on April 26, 2021 at 2:20 p.m. with 73 in attendance.

1. The meeting was called to order by the Chair at 2:20 P.M. CST on April 26, 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. Jerry Murphy made a motion to “approve Agenda as presently shown”; Alex Macias seconded the motion. The Chair asked for verbal opposition to motion, where no verbal opposition was recorded. Therefore, the Agenda was approved as shown.
3. Minutes approval  
The Chair commented that the Meeting Minutes of the last meeting were posted on the Transformer Committee website. Dan Mulkey made a motion to “approve the last Meeting Minutes”; Marty Rave seconded the motion. The Chair asked for verbal opposition to motion, where no verbal opposition was recorded. Therefore, the last Meeting Minutes were approved.
4. Confirmation of IEEE SA Essential Patent Statement  
The Chair displayed the Essential Patent information. The Chair asked for any claim of known Patents associated with this work. No patent information was verbally expressed.

5. IEEE SA Copyright Policy Statement  
The Chair displayed the IEEE SA Copyright Policy information. The Chair asked for any comments to which no comments were recorded.
6. Old Business
  - 6.1 Section A.7 – Task Force Report
    - 6.1.1 Carlos Gaytan (Task Force Chair) presented slides depicting how the terms “box”, “enclosure”, “cabinet”, “weather-resistant”, “pad-lockable”, “lockable”, “hinged”, and “other securing methods” were used in existing standards IEEE Std C57.12.10 and IEEE Std C57.12.36. Carlos presented his proposed wording for Section A.7 along with modifications to Figure A.3 to the WG for discussion. The WG had much discussion on the proposed changes. A question was asked if the “accessory box” should be shown in the Cable Termination Cabinet versus the Transformer Tank. There was much discussion pertaining to this question between WG members. The WG decided that the Annex should only specify the location of the accessory box(es) for new installations not retrofit situations. A comment was made to the WG that showing the accessory box(es) in Figure A.3 would give the end user a point to start a conversation with the specific manufacturer. The Chair made modifications to the proposed wording of A.7 and Figure A.3 per the WG direction. Jerry Murphy made a motion to “accept A.7 wording and Figure A.3 as shown”; Rhett Chrysler seconded the motion. The Chair asked for verbal opposition to motion, no verbal opposition was recorded. Therefore, the motion to “accept A.7 wording and Figure A.3 as shown” passed unanimously. These would be placed in a draft of the document as they were shown.
  - 6.2 Section A.9.2 – Task Force Report
    - 6.2.1 Israel Barrientos presented to the WG the list of active standards he found pertaining to Current Sensors. After discussion with the WG, Israel Barrientos made motion to “add IEEE C37.235, IEC 60688 Ed. 3.0 b:2012, IEC 61869-8, and IEC 61869-12 to Section A.9.2”; Jerry Murphy seconded the motion. Discussion with the WG ended with Israel Barrientos and Jerry Murphy accepting a friendly amendment to the original motion resulting in the following wording “add IEEE C37.235, IEC 60688 Ed. 3.0 b:2012, IEC 61869-8, and IEC 61869-12 to be shown in section A.9.2 or the bibliography, whichever is appropriate”. The Chair asked for verbal opposition to the motion, no verbal opposition was recorded. Therefore, the motion to ““add IEEE C37.235, IEC 60688 Ed. 3.0 b:2012, IEC 61869-8, and IEC 61869-12 to be shown in section A.9.2 or the bibliography, whichever is appropriate” passed unanimously.
7. New Business
  - 7.1 The chair displayed section 7.2 Dielectric Tests to address a comment from a WG member. The Chair displayed three slides for WG discussion. There was much discussion within the WG, however due to time restraints the Chair tabled the discussion on this section until the next meeting.
8. The meeting adjourned at 3:35 P.M. CST.

Submitted by: Scott Dahlke.

Date: 4/28/2021

**Attendance:**

NAME	Affiliation	M or G
Scott Abbott	PPG	Guest
Kayland Adams	SPX Transformer Solutions, Inc.	Guest
Angela Amador	EATON Corporation	Guest
Glenn Andersen	Fayetteville PWC	Guest
Gregory Ante	Southern California Edison	Guest
Hugo Avila	Hitachi ABB Power Grids	Guest
Israel Barrientos	Prolec GE	Member
Wallace Binder	WBBinder Consultant	Guest
John Chisholm	IFD Corporation	Member
Rhett Chrysler	ERMCO	Member
Michael Dahlke	Central Moloney, Inc.	Secretary
Eric Doak	D4EnergySolutions LLC	Guest
Jose Gamboa	H-J Family of Companies	Member
Benjamin Garcia	Southern California Edison	Member
Carlos Gaytan	Prolec GE	Member
Ali Ghafourian	H-J Enterprises, Inc.	Member
Monty Goulkhah	Kinectrics	Guest
Said Hachichi	Hydro-Quebec	Member
Kenneth Hampton	Baltimore Gas & Electric	Member
Ramadan Issack	American Electric Power	Guest
Gael Kennedy	GR Kennedy & Associates LLC	Member
Gary King	Howard Industries	Member
Brian Klaponski	Carte International Inc.	Member
John Kotula	Dominion Energy	Guest
Andrew Larison	Hitachi ABB Power Grids	Guest
Weijun Li	Braintree Electric Light Dept.	Member

Name	Affiliation	M or G
Christopher Lianides	Southern California Edison	Guest
Alejandro Macias	CenterPoint Energy	Member
Lee Matthews	Howard Industries	Guest
Kent Miller	T&R Electric Supply Co.	Guest
Justin Minikel	EATON Corporation	Guest
Rhea Montpool	Schneider Electric	Member
Michael Morgan	Duke Energy	Member
Daniel Mulkey	Mulkey Engineering Inc.	Member
Jerry Murphy	Reedy Creek Energy Services	Member
Dwight Parkinson	EATON Corporation	Member
Chris Pitts	Howard Industries	Guest
Juan Ramirez	CELECO	Member
Kevin Rapp	Cargill, Inc.	Guest
Martin Rave	ComEd	Member
Samuel Reed	EATON Corporation	Guest
Robert Reepe	Georgia Power Co.	Guest
Afshin Rezaei-Zare	York University	Guest
Albert Sanchez	Knoxville Utilities Board	Guest
Steven Schappell	SPX Transformer Solutions, Inc.	Member
Jeffrey Schneider	Power Partners/Spire Power Solutions	Member
Jaber Shalabi	Van Tran Industries, Inc.	Member
Hamid Sharifnia	Consultant	Guest
Avijit Shingari	Pepco Holdings Inc.	Guest
Stephen Shull	BBC Electrical Services, Inc.	Chair
Audrey Siebert-Timmer	IFD Corporation	Member
Igor Simonov	Toronto Hydro	Member

Name	Affiliation	M or G
Edward Smith	H-J Family of Companies	Member
Muhammad Sohail	Trench Limited	Guest
James Spaulding	Fort Collins Utilities	Member
Christopher Sullivan	Westmark Partners	Member
Radoslaw Szewczyk	Specialty Products Poland Sp. z o.o.	Guest
Stephen Taipala	Eaton Corporation	Guest
Eric Theisen	Metglas, Inc.	Member
Michael Thibault	Pacific Gas & Electric	Member
Timothy Tillery	Howard Industries	Guest
Alan Traut	Howard Industries	Member
Jeremy Van Horn	IFD Corporation	Member
John Vartanian	National Grid	Member
Joshua Verdell	ERMCO	Guest
Duy Vo	Central Maine Power (AVANGRID)	Guest
Pragnesh Vyas	Sunbelt-Solomon Solutions	Member
Alan Washburn	Burns & McDonnell	Guest
Bruce Webb	Knoxville Utilities Board	Member
Alan Wilks	Consultant	Member
Joshua Yun	Virginia Transformer Corporation	Member
Malia Zaman	IEEE	Guest
Michael Zarnowski	Carte International	Guest

**C.2.4 C57.12.36 – Distribution Substation Transformers – Jerry Murphy**

This working group did not meet.

**C.2.5 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 April 26, 2021 at 12:55 p.m. with 66 in attendance.

The Chair called the virtual meeting to order at 12:55 pm CDT.

The Chair called for essential patents and the essential patents presentation slides were shown. No essential patents were brought forward.

The Chair advised the Working Group participants of the IEEE-SA copyright policy and the copyright presentation slides were shown.

9 New Members were introduced to the Working Group.

Quorum was established with 32 out of 51 Working Group members present per poll results generated. Note: (2) - Guests marked as being Members during the poll for Quorum and the attendance was adjusted accordingly.

The agenda for the meeting was presented. Jerry Murphy offered a motion with a second from Steve Shull to approve the agenda. The agenda was unanimously approved.

The meeting minutes for the Fall 2020 virtual meeting were posted on the Distribution Subcommittee website after the meeting for the Working Group members to review. There were no proposed changes to the meeting minutes brought forth. Jerry Murphy offered a motion with a second from Jeremy Van Horn to approve the meeting minutes. The meeting minutes were unanimously approved.

The Chair informed the Working Group that the most recent standard was published in August 2014, and the next revision is due in December 2024.

### **Old Business:**

#### **Task Force – Internal Components**

Jarrold Prince presented a revised informative Annex proposal for transformer accessories developed by Task Force of Craig DeRouen, Jim Spaulding, and Mike Thibault with Craig as the Task Force lead. The Task Force presentation is included as a separate file accompanying the meeting minutes (C57.12.38-Components Definitions-Rev 3 with No Images.pdf). This revised informative Annex proposal will be added into the current Draft before for the next revision of C57.12.38 without any sketches/drawings until proper copyright permission is obtained.

#### **Task Force – Review of Figures**

Israel Barrientos presented recommendations for revisions to existing figures in C57.12.38 as the result of a review performed by the Task Force comprised of Jim Spaulding, Mike Thibault, and Israel Barrientos with Israel as the Task Force lead. The Task Force presentation is included as a separate file accompanying the meeting minutes (S18-C57.12.38-TaskForce-FiguresReview.pdf). The updated figures will be added into the current Draft before for the next revision of C57.12.38.

#### **Task Force – Tank Touch Temperature**

Jeremy Van Horn presented information regarding research of tank touch temperature developed by Task Force of Jeremy Van Horn, Dan Mulkey, and Bruce Webb with Jeremy as the Task Force lead. The presentation included findings from review of various industry standards and recommendations regarding surface touch temperature including NASA: A New Approach to Defining Human Touch Temperature Standards, ASTM C1055-03 (Reapproved 2014), UL 1561, and IEEE C57.12.01. Monty Goulkhah during the discussion referenced CSA

C22.2 No 295-15 to be considered. Also, Dan Mulkey mentioned at what temperature does Withdrawal Reflex of Humans occur to protect us? 1<sup>st</sup> Degree Burn. This could be a limit to consider. After some discussion on this topic, Jerry Murphy recommended information regarding tank touch temperature be incorporated into the Enclosure Integrity standards therefore it will cover all types of distribution transformers. The Task Force will propose a note to the WG at the next meeting to be voted on to bring forth to the Enclosure Integrity standards for possible inclusion into those standards. The Task Force presentation is included as a separate file accompanying the meeting minutes (Presentation to C57.12.38 Working Group V3.2 - Tank Touch Temperature.pptx).

### **New Business:**

A new Draft will be posted for Working Group to review before the Fall 2021 meeting that includes the most recent material submitted.

A total of 7 guests requested Working Group membership which will be reviewed to determine who is eligible for membership before the next meeting.

The Chair announced the Working Group will meet at the Fall 2021 meeting in Milwaukee, WI or in a virtual meeting.

The Chair adjourned the meeting at approximately 2:05 pm CDT.

Submitted by: Jarrod Prince and Martin Rave

Date: 05/03/2021

### **List of Attendees and Affiliations:**

1	Adrian Silgardo	IFD Corporation
2	Afshin Rezaei-Zare	York University
3	Alan Wilks	Consultant
4	Albert Sanchez	Knoxville Utilities Board
5	Alejandro Macias	CenterPoint Energy
6	Ali Ghafourian	H-J Enterprises, Inc.
7	Andrew Larison	Hitachi ABB Power Grids
8	Angela Amador	EATON Corporation
9	Avijit Shingari	Pepco Holdings Inc.
10	Baitun Yang	R.E. Uptegraff
11	Benjamin Garcia	Southern California Edison
12	Bruce Webb	Knoxville Utilities Board
13	Carlos Gaytan	Prolec GE
14	Chris Pitts	Howard Industries
15	Christopher Lianides	Southern California Edison
16	Christopher Sullivan	Westmark Partners
17	Daniel Mulkey	Mulkey Engineering Inc.
18	Duy Vo	Central Maine Power (AVANGRID)
19	Dwight Parkinson	EATON Corporation

20	Edmundo Arevalo	Bonneville Power Administration
21	Eric Theisen	Metglas, Inc.
22	Gael Kennedy	GR Kennedy & Associates LLC
23	Glenn Andersen	Fayetteville PWC
24	Gregory Ante	Southern California Edison
25	Hamid Sharifnia	Consultant
26	Igor Simonov	Toronto Hydro
27	Israel Barrientos	Prolec GE
28	Jaber Shalabi	VanTran Industries, Inc.
29	James Edward Smith	H-J Family of Companies
30	James Gardner SPX	Transformer Solutions, Inc.
31	James Spaulding	Fort Collins Utilities
32	Jared Bates	Oncor Electric Delivery
33	Jarrod Prince	ERMCO
34	Jeffrey Schneider	Power Partners/Spire Power Solutions
35	Jeremy Van Horn	IFD Corporation
36	Jerry Murphy	Reedy Creek Energy Services
37	John Vartanian	National Grid
38	Jorge Cruz	PTI Transformers
39	Joshua Verdell	ERMCO
40	Juan Ramirez	CELECO
41	Justin Minikel	EATON Corporation
42	Kendrick Hamilton	Power Partners, Inc.
43	Kenneth Hampton	Baltimore Gas & Electric
44	Kent Miller	T&R Electric Supply Co.
45	Lesther Alex Quispe Cuadrado	EATON Corporation
46	Malia Zaman	IEEE SA
47	Martín Muñoz	Orto de Mexico
48	Martin Rave	ComEd
49	Michael Dahlke	Central Moloney, Inc.
50	Michael Hardin	H-J Enterprises, Inc.
51	Michael Morgan	Duke Energy
52	Michael Thibault	Pacific Gas & Electric
53	Monty Goulkhah	Kinectrics
54	Paul Florida	Howard Industries, Inc.
55	Pedro Salgado	Electronic Technology Inc.
56	Pragnesh Vyas	Sunbelt-Solomon Solutions
57	Ramadan Issack	American Electric Power
58	Rhett Chrysler	ERMCO
59	Robert Reepe	Georgia Power Co.
60	Said Hachichi	Hydro-Quebec
61	Sami Debass	Electric Power Research Institute (EPRI)
62	Scott Abbott	PPG
63	Shelby Walters	Howard Industries
64	Stephen Shull	BBC Electrical Services, Inc.
65	Stephen Taipala	Eaton Corporation
66	Timothy Tillery	Howard Industries

### **C.2.6 C57.12.39 – Tank Pressure Coordination – Carlos Gaytan**

This working group did not meet

### **C.2.7 Task Force on Transformer Efficiency and Loss Evaluation – Phil Hopkinson**

Phil presented the following minutes from the task force meeting on April 26, 2021 at 9:10 a.m.

#### **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

#### **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**

- i. **Phil Hopkinson Introduction**
- ii. **Dan Mulkey Report on Utility Loading Data**
- iii. **Steve Rosenstock report on future utility outlook**
- iv. **Kevin Rapp on insulation thermal class**
- v. **Tom Prevost report on Thermally Upgraded Kraft Paper**
- vi. **Case Ballard report on Thermally Upgraded solid materials**
- vii. **Al Traut report on Dual Nameplate Designs**

#### **7. Documents**

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

#### **8. Next meeting--date and location**

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

### **C.2.8 PC57.167 – Guide for Monitoring Distribution Transformers – Gary Hoffman**

Gary presented the following minutes from the working group meeting on April 27, 2021 at 4:45 p.m. with 61 in attendance.

1. Call to order and Chair's remarks – Called to Order at 2:00PM by Gary Hoffman
2. Quorum Verification – Took count with 37 members and had a Quorum.

3. Approval of agenda for this meeting. No Objections. Motion by Jerry Murphy, and Second by Steve Shull– Unanimously Approved
4. Approval of the meeting of Fall 2019 were approved. No Objections. Motion by Trenton Williams, and Second by Hakim Dulac.
5. Task Force Reports was presented as follows:
  - 8.1.1 Cathodic Protection on distribution transformers- Brad Kittrell
  - 8.1.2 Discuss Air monitor for Combustible or non-Habitable gases
  - 8.2 Clause 6: Method of alert, and Telemetry- Thibault/Shull
6. New Business No new business
7. Next meeting is in September 2021
8. Adjournment

#### **C.2.9 C57.12.35 – Bar Coding for Transformers and Regulators– Rhett Chrysler**

Rhett Chrysler presented the following minutes from the working group meeting on April 27, 2021 at 12:55 p.m. with 39 in attendance.

1. Chair called the meeting to order at 12:55pm CDT.
2. Total attendance of 39 is listed below. 18 of 24 members present and quorum was verified (75%). 1 guest requested membership.
3. Chair called for identification of essential patents pertaining to the work of this WG. None brought forward to the TF. Copyright policy presented.
4. Motion to approve meeting agenda by Ed Smith, 2<sup>nd</sup> by Lee Matthews, Approved unanimously.
5. Motion to approve Fall 2020 (Virtual) meeting minutes by Steve Shull, 2<sup>nd</sup> by Ed Smith, Approved unanimously
6. Chair Report
  - a. Chair announced that Jerry Murphy has volunteered to be vice chair of this working group.
  - b. 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.
7. Old Business
  - a. TF Report on QR Code – Israel Barrientos, Issack Ramadan, Dan Mulkey, Ken Hampton.



- i. Israel presented an example of converting the C57.12.37 electronic test data to QR codes, one with the standard data set, one with the extended data set.
    - ii. Steve Shull suggested adding a unique de-limiting character to differentiate the fields in the file, eg, a pipet symbol.
    - iii. Steve Shull made a motion to form a new task force to survey users in the Distribution Subcommittee to get feedback on the use of QR codes, what information should be included in the permanent code and the temporary code. New TF includes Rhett Chrysler, Israel Barrientos and Mike Thibault. A proposed questionnaire will be developed and circulated within the WG for comment. Rhett to develop a timeline for this TF.
  - b. TF Report on Editorial Review – Darren Brown, Ed Smith, Alan Traut (carryover from F20 meeting)
    - i. Figure 7 missing side location for label placement, Alex Macias volunteered to create side view for inclusion
    - ii. TF raised the issue regarding use of “manufacturer” vs “producer” in the document, especially regarding the identification of the serial number.
    - iii. Motion made by Steve Shull, 2<sup>nd</sup> by Alex Macias to use “manufacturer” throughout the 12.35 document in place of “producer”. Motion carried 16 for, 0 against, 1 abstain.
8. New Business
- a. A request for a new manufacturer code ‘NS’ from Gilbert Kozar of Northeast Transformer Services. The code NS is presently unassigned. Since the list of manufacturer codes is in a separate file and not part of the 12.35 document, Rhett Chrysler will follow up with Malia Zaman of IEEE to determine what process should be used to add a new code.
9. Next meeting October 17-21, 2021 Milwaukee, WI
10. Meeting adjourned at 2:10pm CDT.

Submitted by: Alan Traut, Secretary

Date: 04/27/2021, Revised attendance 05/27/2021

Attendance:

First Name	Last Name	Affiliation	Role
Glenn	Andersen	Fayetteville PWC	Member
Gregory	Ante	Southern California Edison	Guest
Israel	Barrientos	Prolec GE	Member
Darren	Brown	Howard Industries	Member
Rhett	Chrysler	ERMCO	Chair
Carlos	Gaytan	Prolec GE	Member
Ali	Ghafourian	H-J Enterprises, Inc	Guest
Kenneth	Hampton	Baltimore Gas & Electric	Member
Ramadan	Issack	American Electric Power	Member

Kristen	James	EATON Corporation	Guest
Gary	King	Howard Industries	Member
Andrew	Larison	Hitachi ABB Power Grids	Guest(R)
Christopher	Lianides	Southern California Edison	Guest
Alejandro	Macias	CenterPoint Energy	Member
Lee	Matthews	Howard Industries	Member
Kent	Miller	Consultant	Guest
Michael	Morgan	Duke Energy	Member
Dan	Mulkey	Mulkey Engineering	Member
Jerry	Murphy	Reedy Creek Energy Services	Vice Chair
Dwight	Parkinson	EATON Corporation	Guest
Chris	Pitts	Howard Industries	Guest
Jimmy	Rasco	Rasco Consulting, LLC	Guest
Martin	Rave	ComEd	Guest
Robert	Reepe	Georgia Power Co.	Guest
Albert	Sanchez	Knoxville Utilities Board	Guest
Avijit	Shingari	Pepco Holdings Inc.	Member
Stephen	Shull	BBC Electrical Services, Inc.	Member
Adrian	Silgado	IFD Corporation	Guest
Edward	Smith	H-J Family of Companies	Member
James	Spaulding	Fort Collins Utilities	Guest
Eric	Theisen	Metglas, Inc	Guest
Michael	Thibault	Pacific Gas & Electric	Member
Alan	Traut	Howard Industries	Secretary
Jeremy	Van Horn	IFD Corporation	Guest
Joshua	Verdell	ERMCO	Guest
Duy	Vo	Central Maine Power (AVANGRID)	Guest
Shelby	Walters	Howard Industries	Guest
Bruce	Webb	Knoxville Utilities Board	Guest
Alan	Wilks	Consultant	Guest

### **C.3 Old Business**

- No old business was discussed

### **C.4 New Business**

- Phil Hopkinson brought forth a talking point regarding classification of various types of transformers. He noted that he was working with NEMA to establish new transformer classifications.
  - Proposal was:
    - Class 1 Distribution transformer 2500 kVA and below

- Class 2 Distribution transformer larger
- Ed Smith instructed Phil to gather his data and we could look into establishing a task force.

#### **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 10:15am.

List of Attendees and Affiliations:

Role	First Name	Last Name	Company
Guest	Nabi	Almeida	Prolec GE USA LLC
Guest	Glenn	Andersen	Fayetteville PWC
Guest	Gregory	Ante	Southern California Edison
Guest	Edmundo	Arevalo	Bonneville Power Administration
Member	Javier	Arteaga	Hitachi ABB Power Grids
Guest	Hugo	Avila	Hitachi ABB Power Grids
Member	Donald	Ayers	Ayers Transformer Consulting
Guest	Suresh	Babanna	SPX Transformer Solutions, Inc.
Guest	Gilles	Bargone	FISO Technologies Inc.
Member	Israel	Barrientos	Prolec GE
Guest	Jared	Bates	Oncor Electric Delivery
Guest	Olle	Benzler	Megger
Guest	Jean-Noel	Berube	Rugged Monitoring Inc.
Guest	Kevin	Biggie	Weidmann Electrical Technology
Guest	Piotr	Blaszczyk	Specialty Transformer Components LLC
Guest	William	Boettger	Boettger Transformer Consulting LLC
Guest	Sanket	Bolar	Megger
Guest	Dominique	Bolliger, Ph.D.	HV TECHNOLOGIES, Inc.
Guest	Jeffrey	Britton	Phenix Technologies, Inc.
Member	Darren	Brown	Howard Industries
Member	John	Chisholm	IFD Corporation
Member	Rhett	Chrysler	ERMCO
Guest	Bobby	Clift	Xcel Energy
Member	Craig	Colopy	EATON Corporation
Member	John	Crouse	Roswell Alliance
Guest	Jorge	Cruz	PTI Transformers
Member	Thomas	Dauzat	General Electric
Guest	Scott	Dennis	Hitachi ABB Power Grids
Guest	Eric	Doak	D4EnergySolutions LLC
Guest	Lee	Doyle	Vaisala
Guest	Hakim	Dulac	Qualitrol Company LLC
Guest	Samraghi	Dutta Roy	Siemens Energy
Guest	William	Elliott	Prolec GE
Guest	Reto	Fausch	RF Solutions
Member	Roger	Fenton	Fenton Solutions
Guest	Paul Gabriel	Florida	Howard Industries, Inc.
Guest	George	Frimpong	Hitachi ABB Power Grids
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	Zoran	Goncin	PTI Transformers
Guest	Luis	Gonzalez	Conduct Industries Limited
Guest	James	Graham	Weidmann Electrical Technology
Guest	Attila	Gyore	M&I Materials Ltd
Member	Said	Hachichi	Hydro-Quebec
Guest	Kendrick	Hamilton	Power Partners, Inc.
Guest	Didier	Hamoir	Transformer Protector Corp
Guest	Kenneth	Hampton	Baltimore Gas & Electric
Member	Michael	Hardin	H-J Enterprises, Inc.
Guest	Kyle	Heiden	EATON Corporation
Guest	Giovanni	Hernandez	Virginia Transformers Corporation
Guest	Sergio	Hernandez Cano	Hammond Power Solutions
Member	Gary	Hoffman	Advanced Power Technologies
Guest	Ryan	Hogg	Bureau of Reclamation
Guest	David	Holland	ExxonMobil
Member	Philip	Hopkinson	HVOLT Inc.
Guest	Ramadan	Issack	American Electric Power
Guest	Kristin	James	Eaton
Member	John	John	Virginia Transformer Corp.
Guest	Jon	Karas	SDMyers, LLC.
Member	Gael	Kennedy	GR Kennedy & Associates LLC
Member	Gary	King	Howard Industries
Guest	Brad	Kittrell	Consolidated Edison Co. of NY
Member	Brian	Klaponski	Carte International Inc.
Guest	John	Lackey	PowerNex Associates Inc.
Guest	Andrew	Larison	Hitachi ABB Power Grids
Guest	Moonhee	Lee	Hammond Power Solutions
Guest	Aleksandr	Levin	Weidmann Electrical Technology
Member	Weijun	Li	Braintree Electric Light Dept.
Guest	Christopher	Lianides	Southern California Edison
Guest	Colby	Lovins	Federal Pacific Transformer
Guest	Tiffany	Lucas	SPX Transformer Solutions, Inc.
Member	Alejandro	Macias	CenterPoint Energy
Member	Tim-Felix	Mai	Siemens Energy
Guest	Jinesh	Malde	M&I Materials Inc.
Guest	Darrell	Mangubat	Siemens Power Operations Inc.
Guest	Richard	Marek	Retired
Member	Lee	Matthews	Howard Industries
Guest	James	McBride	JMX Services, Inc.
Guest	Thomas	Melle	HIGHVOLT
Member	Kent	Miller	T&R Electric Supply Co.

Member	Rhea	Montpool	Schneider Electric
Member	Daniel	Mulkey	Mulkey Engineering Inc.
Vice-Chair	Jerry	Murphy	Reedy Creek Energy Services
Guest	Ali	Naderian	Metsco
Member	Dwight	Parkinson	EATON Corporation
Guest	Chris	Pitts	Howard Industries
Guest	Alvaro	Portillo	Ing. Alvaro Portillo
Guest	Chris	Powell	Intermountain Electronics
Member	Jarrold	Prince	ERMCO
Guest	Lesther Alex	Quispe Cuadrado	EATON Corporation
Member	Ion	Radu	Hitachi ABB Power Grids
Guest	Kevin	Rapp	Cargill, Inc.
Guest	Jimmy	Rasco	Rasco Consulting LLC
Member	Martin	Rave	ComEd
Guest	Samuel	Reed	EATON Corporation
Guest	Leopoldo	Rodriguez	Transformer Testing Services LLC
Guest	Maresh	Sampat	EMS Consulting Inc.
Guest	Albert	Sanchez	Knoxville Utilities Board
Member	Daniel	Sauer	EATON Corporation
Guest	Alan	Sbravati	Cargill, Inc.
Guest	Stefan	Schindler	Maschinenfabrik Reinhausen
Guest	Jeffrey	Schneider	Power Partners/Spire Power Solutions
Guest	Dan	Schwartz	Quality Switch, Inc.
Guest	Pugal	Selvaraj	Virginia Transformer Corp.
Guest	Jaber	Shalabi	VanTran Industries, Inc.
Guest	Samuel	Sharpless	Rimkus Consulting Group
Member	Hemchandra	Shertukde	University of Hartford
Guest	Avijit	Shingari	Pepco Holdings Inc.
Guest	Kunal	Shukla	PECO Energy Company
Member	Audrey	Siebert-Timmer	IFD Corporation
Member	Adrian	Silgado	IFD Corporation
Chair	Edward	Smith	H-J Family of Companies
Guest	Adam	Smith	Commonwealth Associates, Inc.
Member	Steven	Snyder	Hitachi ABB Power Grids
Guest	Markus	Soeller	Power Diagnostix
Guest	James	Spaulding	Fort Collins Utilities
Guest	Markus	Stank	Maschinenfabrik Reinhausen
Guest	David	Stankes	3M
Member	Janusz	Szczuchowski	Maschinenfabrik Reinhausen
Guest	Marc	Taylor	Cogent Power Inc.
Guest	Dervis	Tekin	Meramec Instrument Transformer Co.
Member	Vijay	Tendulkar	Power Distribution, Inc. (PDI)
Guest	Michael	Thibault	Pacific Gas & Electric

Member	Timothy	Tillery	Howard Industries
Member	Alan	Traut	Howard Industries
Guest	Parag	Upadhyay	ABB Inc.
Member	Jeremy	Van Horn	IFD Corporation
Guest	Jacques	Vanier	Electro Composites (2008) ULC
Guest	John	Vartanian	National Grid
Secretary	Joshua	Verdell	ERMCO
Member	Rogério	Verdolin	Verdolin Solutions Inc.
Guest	Duy	Vo	Central Maine Power (AVANGRID)
Guest	Pragnesh	Vyas	Sunbelt-Solomon Solutions
Member	Sukhdev	Walia	New Energy Power Co.
Guest	Shelby	Walters	Howard Industries
Guest	Evanne	Wang	DuPont
Guest	Alan	Washburn	Burns & McDonnell
Member	Bruce	Webb	Knoxville Utilities Board
Guest	Leon	White	H2scan
Guest	William	Whitehead	Siemens Energy
Member	Alan	Wilks	Consultant
Guest	Trenton	Williams	Advanced Power Technologies
Member	Baitun	Yang	R.E. Uptegraff
Member	Joshua	Yun	Virginia Transformer Corporation
Guest	Malia	Zaman	IEEE
Guest	Anand	Zanwar	Siemens Energy
Guest	Michael	Zarnowski	Carte International