

Distribution Transformer Subcommittee

Task force / Working Group Report

Document #: C57.12.28 & C57.12.29

Document Title: Enclosure Integrity

Chair: Dan Mulkey Vice-Chair: Jeremy Van Horn

Secretary: Audrey Siebert-Timmer

Current Draft Being Worked On: 1.3 Dated: April 2021

Meeting Date: April 27, 2021 Time: 8:00 AM CST

Attendance:	Members	<u>43</u>
	Guests	<u>25</u>
	Total	<u>68</u>

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)

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Timothy Tillery (Howard Industries)
Duy Vo (Central Maine Power (AVANGRID))

Michael Zarnowski (Carte International)

Meeting Minutes:

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

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- 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 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.

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- 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.

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- 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 Dazat 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