

# Distribution Transformer Subcommittee Task force / Working Group Report

Document #: \_\_\_\_\_

Document Title:

Chair: \_\_\_\_\_ Vice-Chair \_\_\_\_\_

Secretary \_\_\_\_\_

Current Draft Being Worked On: \_\_\_\_\_ Dated: \_\_\_\_\_

Meeting Date: \_\_\_\_\_ Time: \_\_\_\_\_

Attendance:	Members	_____
	Guests	_____
	Total*	0

\* For details of attendance, please refer to AMS system of the Transformers Committee

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## **Meeting Minutes / Significant Issues / Comments:**

Dan Mulkey called the meeting to order at 8:01 AM. Introductions were performed.

1. Membership changes were noted:
  - a. Removed: Juan Saldivar, Rebecca Giang
  - b. Added: Israel Barrientos, Audrey Siebert-Timmer, Robert Stinson, Shelby Walters
2. Quorum was verified. The working group consisted of 46 members, requiring 23 for quorum. 34 members were confirmed at the time of counting. 36 members were confirmed afterwards through the roster.
3. Alan Traut made a motion, seconded by Mike Thibault, for approval of the minutes. No opposition was raised so the minutes were unanimously approved.
4. Dan Mulkey made a call for any essential patent statements and responses. None were raised.
5. Mike Thibault made a motion, seconded by Alan Traut, for approval of the agenda. No opposition was raised so the agenda was unanimously approved.
6. Status of Standards:
  - a. C57.12.28 Standard for Pad-Mounted Equipment – Enclosure Integrity, Published July15, 2014, Revision Due: 12/31/2024
  - b. C57.12.29 Standard for Pad-Mounted Equipment – Enclosure Integrity for Coastal Environments, Published August 8, 2014, Revision Due date 12/31/2024
  - c. C57.12.31 Standard for Pole Mounted Equipment – Enclosure Integrity, Published September 20, 2010, Revision Due: 6/17/2020, Corrigenda approved May16, 2014
  - d. C57.12.32 Standard for Submersible Equipment – Enclosure Integrity, Reaffirmed 3/7/2008, Revision Due: 12/31/2018, PAR expiration: 12/31/2019
7. Old Business:
  - a. Exposure test evaluation 4.4.1.3 (Comparison of ASTM D1654-05 vs. -08) by Justin Minikel:

Justin Minikel gave a presentation on scribe creepage which will be posted on the website. The 2005 and 2008 ASTM standards use different pass fail criteria, with the 2008 standard allowing some samples to pass that would not pass the 2005 standard. Justin recommended keeping the reference to ASTM D1654 in the Enclosure Integrity

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document as a specific reference to the 2005 publication, and not just a general reference.

Following the presentation, a brief discussion occurred. It was asked if the test in question is a paint test or a corrosion test. Justin clarified that it is a paint test, which affects corrosion, but it's more of a test of adhesion. Mike Thibault commented that the reason a transformer is painted is to keep it from corroding, so if the paint disappears it ought to fail the test.

Ali Ghafourian asked why ASTM changed their test for the 2008 standard. Justin wasn't sure of the reasoning, but mentioned it is a very significant change between the 2005 and 2008 standards, which is uncommon for ASTM.

A **motion** was made by Steve Shull and seconded by Carlos Gaytan to keep the 2005 revision of the ASTM D1654 standard as the reference in all corrosion references across the Enclosure Integrity standards. The motion **passed** with unanimous approval.

During the discussion of the motion, Ron Stahara asked if we had ever referenced any other versions of the ASTM standard. It was suggested we had at some point, and Justin Minikel added this was the first time there'd been a major change to the ASTM D1654 standard. Jerry Murphy added that we have referenced seceded versions of ASTM standards for other IEEE standards such as oil testing. Dan Mulkey said he would be happy to provide feedback to ASTM about the working group's review of the 2008 update to ASTM D1654 if someone could provide a contact.

b. Abrasion Test 4.4.8 by Dan Mulkey

Dan Mulkey presented a revised version of section 4.4.8 which removed the term 'rust' from the document. A **motion** was made by Alan Wilks and seconded by Ed Smith to accept the words as presented in the draft document. The motion **passed** with unanimous approval. No further discussion occurred during the motion.

c. Gravelometer 4.4.9 by Jeremy Van Horn

Jeremy Van Horn presented the differences between the language used in the C57.12.32 draft and the other four published Enclosure Integrity standards for the gravelometer test. There were a few small editorial changes which were presented with little discussion.

The following changes of substance were presented:

1. The sentence "The following test is required only for coated surfaces on the exterior of the enclosure" is in each of the other four documents, but was not included in the C57.12.32 draft document.
2. The test pressure should read 414 kPa (60 psig) instead of 410 kPa (60 psig)
3. C57.12.28 and C57.12.31 use a rating of 4B to 9B for the passing criteria. This is inconsistent with the C57.12.32 draft which uses the term "the minimum rating shall be 7B per SAE J400".
4. C57.12.28 and C57.12.31 use a maximum rusted chip size of 3 mm for the passing criteria. This is inconsistent with the C57.12.32 draft which gives a maximum chip sizes of 2.0 mm.

A prolonged discussion followed the presentation. The question was asked if it was worth keeping the reference to SAE J400, or if it would be better to simply state a maximum chip size. There was a comment that a 6A rating may be better than a 7B rating because of the difference in both chip size and quantity. Jerry Murphy commented that a plate with very high number of pin-pricks would not be ideal, even if the pricks are small.

It was commented that it might not be wise to increase the maximum paint chip size beyond the 2.0 mm used in the C57.12.29 and C57.12.30 standards. A smaller chip

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size is better than bigger because it will result in more robust coatings. As a side note, Justin Minikel was added to membership by Dan Mulkey.

A **motion** was made by Justin Minikel and was seconded by Steve Shull after an accepted friendly amendment by Steve to change the phrasing to: "The minimum rating shall be 7B per SAE J400, and no rusted chip shall be greater than 2.0 mm (0.08 in) in Diameter. The motion **passed** unanimously.

A **motion** was made by Robert Stinson to add following clause back into the paragraph: "the following test is required only for coated surfaces on the exterior of the enclosure." The motion was not seconded and **failed**.

d. Other comments on the draft document

Dan Mulkey began to lead the working group through the remaining proposed changes in the draft document.

• Section 3.2.2 Submergibility test

A prolonged discussion regarding the nature and necessity of the submergibility test occurred. Dan Mulkey explained that it is a more severe test to test at 1 foot of water submersion than 10 feet of water submersion because there is less seating force on the gaskets of many components at 1 foot of water pressure. Two possible options can be used for testing: either the tank can be put under vacuum and submerged to 10 feet of water, or pressurized and submerged with a small amount of water. Igor Simonov added that 10 feet of water submersion can be simulated by applying the appropriate level of vacuum. A discussion about the method and frequency of pressure measurements during a submersion test occurred. Igor Simonov suggested using a pressure data-logger to ensure that the appropriate pressure remained on the transformer for the entire test duration. This can be done along with a UV light inspection of the interior of the transformer after the test duration. Gary King suggested that a pressure gauge could be used instead of a data-logger, since knowing the initial and final pressures of the tank will indicate whether or not it remained sealed. It was then discussed that measurements could be taken at a variety of different intervals, but an appropriate interval was not concluded by the working group. Mike Thibault asked what the advantage of using a data-logger instead of visually checking for bubbles was. Igor Simonov suggested that it would prevent the need for someone to be present for the duration of the test. A question was asked if it was necessary to run both a positive and negative (vacuum) pressure test. Dan Mulkey suggested that both should be done. Brian Klaponski asked if there was a need to be running a type test for sealing at all, and that it may be impractical to perform the test on many larger units.

A **motion** was made by Igor Simonov and seconded by Anil Dhawan to change the submergibility test to require a vacuum test pressure simulating 10 feet of water applied to the tank for 7 days while recording the pressure with a data logger. At the end of 7 days, the tank would be checked for loss of pressure and water leaks. The motion **failed** with 4 in favor and 15 opposed.

A **motion** was made by Mike Thibault to include a vacuum test along with the pressure test with the following parameters:

- Apply 10 feet of pressure (4.5 psi)
- 1 foot of water submersion
- 7 days of vacuum, 7 days of pressure
- Pass criteria: the final gauge reading is the same as the initial (within 0.1 psig) and no observable water leaks

Due to time constraints, the motion was **tabled** until the next meeting.

There was no New Business. The meeting was adjourned at 9:15 am.

Next meeting—Oct 16, 2018 in Jacksonville, FL, USA

## **Distribution Transformer Subcommittee Working Group Report**

Copies of any handouts and/or subgroup reports will be made available as separate items but referenced by these minutes.

The following attendees requested membership and will be added to membership for the Fall 2018 meeting:

- Michael Morgan
- Babanna Suresh

Submitted by: Jeremy Van Horn  
Date: 03/27/2018