

Distribution Transformer Subcommittee

Task force / Working Group Report

Document #: C57.12.32

Document Title: Enclosure Integrity

Chair: Dan Mulkey Vice-Chair Jerry Murphy

Secretary Jeremy Van Horn

Current Draft Being Worked On: D2.1 Dated: April 2017

Meeting Date: 4/4/2017 Time: 8:00 AM

Attendance:	Members	<u>31</u>
	Guests	<u>27</u>
	Total*	<u>58</u>

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

Meeting Minutes / Significant Issues / Comments:

A call for was made for essential patent statement and responses. None were raised. Introductions were performed and membership changes were noted. Quorum was verified. The working group consisted of 42 members, requiring 21 for quorum. 22 members were confirmed at the time of counting. Jerry Murphy made the call for any opposition to unanimous approval of the minutes. No opposition was raised so the minutes were unanimously approved.

The Status of Standards covered by this working group was made by the Chair:

- 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

Under Old Business, a report on accelerated UV testing was presented by Scott Abbott, PPG with an introduction by Rebecca Giang, Sherwin-Williams. Rebecca provided an overview of the coatings test that had been run using the FS-40, QUV-A and QUV-B bulbs since the last WG meeting in Vancouver. She mentioned that one driver for the test is that the FS-40 bulb is an old technology which will not work in the new test chambers. Scott Abbott presented detailed results from the coatings test. The following conclusions were given in his presentation:

- Variability observed between panels exposed to different bulbs
- Results indicate that longer test duration and/or higher % gloss retention requirements beyond the current 500 hour duration and 50% gloss retention requirement using FS-40 bulbs would be recommended if using UVA-340 bulbs
- Additional test results are needed before proposing a test method specification requirement using UVA-340 bulbs

After the presentation, a discussion took place. Mike Thibault asked how 1200 hours of testing compared to 1200 hours of “real life” usage. Scott Abbott mentioned that this is very difficult to determine. Rebecca Giang added that typically this type of test gives comparative results between different coating systems. Carlos Gaytan asked if the 70% retention criteria for the QUV-A test method came from the test results or from another source. Scott Abbott responded that it had come from the test results, and that when they were looking at the data it became apparent that 70% was a reasonable value. Dwight Parkinson asked how it was possible to have a gloss retention result above 100%, as some of the test results indicated. Scott Abbott mentioned that it could be a result in variability in the measurements, or in the smoothness or

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flatness of the samples. He also mentioned that it may be possible they're being polished during the test cycle. Rebecca Giang added that there is a large range in the metal profiles. A question was asked if there was any correlation between how much gloss the panels started with versus how much gloss was retained. Rebecca Giang commented that it doesn't seem to have had an effect, except in the case of the negative controls. When the coating is not performing well, it doesn't matter if the initial gloss is high or low, the final result will not be good. Scott Abbott added that typically there would be better gloss retention in a high gloss coating than a low gloss coating with all other things being equal. The question was asked if the standard should switch to the QUV test, and if the black panels would need a different standard. Scott Abbott mentioned that if a switch to the QUV test method was done, the test duration would need to increase as well as the baseline level. He also mentioned that we needed more test results to comment on the black data. Rebecca Giang agreed that the test should be run out to 1500 or 2000 hours as is currently planned. Jerry Murphy commented that black coatings are typically used in underground applications, and therefore light exposure might be limited. It was mentioned that these transformers may still be exposed to significant levels of UV while they are in a yard or during field use such through gridding in underground vaults. Mike Thibault asked how the high QUV exposure affects the durability of the coating. Rebecca Giang commented that it tends to make it more brittle with a higher chance of peeling off the substrate. Scott Abbott agreed that long term exposure to the extreme conditions may result in flaking off. QUV looks at UV, temperature and humidity, but does not include rainfall and environmental effects. There are other tests to simulate these items, but they are longer tests with more expensive equipment. Rebecca Giang commented that one motivation to change to the QUV-A or B bulbs is that the FS-40 bulb doesn't have irradiant control as it is old technology. As a result, it is unknown what type of intensity is hitting the panel. A new method would result in more consistent data. Jerry Murphy added that the investigation into alternate test methods initially came up from a comment indicating the FS-40 bulb may not be available. Since then it's been discovered that the FS-40 bulb is available, but the question has been asked if that the use of this bulb still makes sense to determine the effect of light on the coating finish since the bulb is obviously moving toward obsolescence. Rebecca Giang and Scott Abbott agreed that the QUV-A340 bulb would better fit for the coatings test.

In new business, the group continued to review the document. The draft standard was reviewed beginning with Paragraph 4.5.6 Ultraviolet accelerated weathering test (QUV). Rebecca Giang commented that the recommendation in the ballot comment "Working to see if we have an equivalent – potentially QUVA-303 with lower irradiance level" is not correct. The bulb being investigated is the QUV-A340. Someone asked how condensation mentioned in the paragraph would be addressed. Scott Abbott mentioned that adding condensation is part of the QUV cycle. Mike Thibault suggested that it might better if the test was run until the coating systems failure, recording where this occurs. A **motion** was made by Steve Shull and seconded by Carlos Gaytan to table the discussion on paragraph 4.5.6 until the next meeting. The motion passed with unanimous approval.

Next, paragraph 4.5.7 Simulated corrosive atmospheric breakdown (SCAB) was reviewed by the working group. The original paragraph and a proposed new paragraph by Dan Mulkey were reviewed. A **motion** was made by Rebecca Giang and seconded by Steve Shull to delete the original paragraph in the section. A friendly amendment was made by James Gardner and accepted by Rebecca and Steve to accept the paragraph as revised by Dan Mulkey and delete the second paragraph. Another friendly amendment was made Darren Brown and accepted by Rebecca and Steve to remove the words "both the exterior and interior cabinet / frontplate surfaces of the pad-mounted" from the first sentence of the paragraph. A third friendly amendment was made by Steve Shull and accepted by Rebecca to add dates to the references of ASTM D1654 in the paragraph. There was discussion about whether or not the # of cycles should be reduced to 15 or left at 20 as in the original paragraph, but no further friendly amendments were made. The motion passed unanimously.

With this the meeting was adjourned due to time. The next meeting will be held in Louisville, KY, USA.

Submitted by: Jeremy Van Horn

Date: 4/4/2017