Annex C Distribution Subcommittee – Chair: Stephen Shull

March 28, 2018
Pittsburgh, PA, USA

Chair: Stephen Shull
Vice-Chair: Jerry Murphy
Secretary: Josh Verdell

C.1 General Opening

Steve opened the meeting welcoming everyone to the meeting. Jerry circulated the rosters. To establish a quorum, a list of members was displayed and a count of was made. We did have a quorum with 32 of the 55 members in attendance by count of those identified on a slide presented in the meeting. Recorded attendance gave 124 in attendance, 38 members and 22 requesting membership.

The agenda was reviewed, motion made by Dan Sauer, seconded by Marty Rave and approved by unanimous acclamation of the members in attendance.

The Spring 2017 meeting minutes were reviewed, and a motion was made by Dan Sauer, seconded by Marty Rave and approved by unanimous acclamation of the members in attendance.

C.2 Working Group and Task Force Reports

[redacted]C57.15/IEC 60076-21 – Step-Voltage Regulators – Craig Colopy

Craig presented the following minutes from the working group meeting on March 26, 2018 at 4:45 p.m. with 40 people in attendance.

1 Craig Colopy opened the meeting and introductions were made by the attendees.

2. Distribution of attendance sheets. Essential Patent call made by Craig Colopy - None received from attendees. Check for Quorum was made, 25 from a visual count Members in attendance.

3. Approval of agenda - Steve Shull made Motion, Dan Sauer seconded, no opposition to approval.

4. Approval of minutes from Fall meeting in Louisville, Kentucky, USA - Motion for approval by Wally Binder and second by Dan Sauer, no opposition to approval.

5. IEC editorial review received by chairman on Draft 3.0 (CDV). IEEE-SA board has approved Draft 3.2 and was released to IEEE editorial staff. Chairman's review of IEC editorial review of Draft 3.0 and document changes between Draft 3.0 and 3.2 were submitted to the Secretary of IEC for review. During the CDV of Draft 3.0, comments and suggested changes from member countries were made. Chairmen reviewed these comments and suggested changes with the WG. WG responses are documented and will be sent along with an updated Draft to the IEC TC 14 Secretary for review. The Secretary will then submit a revised draft for the FDIS stage to the IEC. This will then be sent for translation, and then edited before the FDIS circulation.

6. Future meetings

2018 Fall Oct 14 – 18, 2018 Jacksonville, FL

7. Move for Adjournment - Fred made Motion, Steve Shull seconded, no opposition to approval. Close of meeting

Submitted by: Gael R Kennedy and Craig Colopy

[redacted]C57.12.20 – Overhead Distribution Transformers – Al Traut

Al presented the following minutes from the working group meeting on March 26, 2017 at 11:00 a.m. with 77 in attendance.

The meeting was called to order at 11:02am on 03/26/2018 immediately followed by introductions.

The patent policy was reviewed per guidelines from the ADCOM Meeting:

"If any individual believes that Patent Claims might be Essential Patent Claims, that fact should be made known to the entire working group and will be duly recorded in the minutes of the working group meeting. This request shall occur at every standards-developing meeting once the PAR is approved by the IEEE-SA Standards Board."

NONE WERE BROUGHT FORWARD

The Chair then move to the rosters and membership

Three new members added since last meeting

Israel Barrientos

Eric Theisen

Lee Welch

Based on the WG members listed on the rousted and projected at the meeting a quorum was declared after a showing of hands (33 members present).

Four attendees requested membership during the S18, Pittsburgh, PA meeting

The Chair asked if any member objected to the proposed agenda as displayed to the Working Group. No objections were brought forward so the agenda was approved as submitted. A copy is listed below for record purposes.

IEEE Transformers Committee

WG Overhead Distribution Transformers C57.12.20

Meeting Location/Time:Omni William Penn Hotel

Pittsburgh, PA

Monday March 26, 2018, 11:00am – 12:15pm

Meeting Agenda:

1. Welcome, Introductions & Rosters
2. Call for Patents
3. Membership & Quorum
4. Approval of Agenda

5. Approval of Previous Minutes
6. Chair Report
7. Old Business

a. Review topics for next draft

8. New Business

a. New PAR vote

9. Next Meeting Announcement
10. Adjourn

The Chair asked if any member objected to the F17 (Louisville, KY) minutes as submitted to the Working Group. No objections were brought forward; therefore, the F17 Minutes were unanimously approved at the S18 Pittsburgh, PA meeting. Rod Stahara made motion seconded by second by Said Hachichi.

The Chair reviewed the status of the current document (see below)

C57.12.20-2011 published on September 20, 2011.

10-year cycle ends September 20, 2021

PAR approved by NESCOM June 2012.

PAR Extension granted Dec 2016

PAR Expires December 31, 2017 (1 yr extension)

D6 Approved at 9/28/2017 RevCom Meeting

C57.12.20-2017 published 11/20/2017

The Chair thanked everyone for their hard work to get C57.12.20 document published.

Primary focus for this meeting is agreeing on the agenda for the next revision. The Chair suggested the following topics to be considered . . .

Introduce and address the platform mounting arrangement into the standard. This topic will not be pursued in the next revision.

Update 12.20 to reference 12.39 regarding tank pressure and pressure relief. Carlos Gaytan agreed to head this up.

Three phase connections are currently delta and wye only. Do we want to include the TT connection in this standard? Giuseppe Termini agreed to head this up

LV Terminals. We need to address some of the interchangeability discussion. We need to make sure that this standard follows what is being addressed in C57.19.02 ,i.e. tank hole and stud sizes, etc. The Chair suggested that we wait until C57.19.02 gets further along to avoid the duplication of effort. Agreement from the members to defer this activity until C57.19.02 is further along and we have a clearer direction.

There are some things in the document that may need to be rearranged and placed in different clauses., eg, lifting lugs & support Lugs. Are they tank features or accessories? The Chair (Al Traut) agreed to work on this.

Should we consider adding the requirements for coastal application to align with 12.30 Enclosure Integrity? Mike Thibault Agreed to work on this. Bill Wimmer agreed to help.

The Chair pointed out that technically we are without a PAR . . . Between now and the next meeting let's look at the scope and purpose to submit for the PAR

Current Document lists . . .

Title

IEEE Standard for Overhead-Type Distribution Transformers 500kVA and Smaller: High Voltage, 34 500 V and Below; Low Voltage, 7970/13 800Y V and Below

1.1 Scope

This standard covers certain electrical, dimensional, and mechanical characteristics and safety features of single- and three-phase, 60-Hz, liquid-immersed, self-cooled, overhead-type distribution transformers 500 kVA and smaller, high voltages 34 500 V and below and low voltages 7970/13 800Y V and below.

1.2 Purpose

This standard is intended for use as a basis for determining the performance, interchangeability, and safety of overhead-type distribution transformers and to assist in the proper selection of this equipment.

The next meeting will be held October 2018 in Jacksonville, FL

Meeting adjourned 11:40

Submitted by: Ed Smith

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 March 27, 2018 at 8:00 a.m. in with 77 in attendance.

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

Membership changes were noted:

Removed: Juan Saldivar, Rebecca Giang

Added: Israel Barrientos, Audrey Siebert-Timmer, Robert Stinson, Shelby Walters

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.

Alan Traut made a motion, seconded by Mike Thibault, for approval of the minutes. No opposition was raised so the minutes were unanimously approved.

Dan Mulkey made a call for any essential patent statements and responses. None were raised.

Mike Thibault made a motion, seconded by Alan Traut, for approval of the agenda. No opposition was raised so the agenda was unanimously approved.

Status of Standards:

C57.12.28 Standard for Pad-Mounted Equipment – Enclosure Integrity,

Published July15, 2014, Revision Due: 12/31/2024

C57.12.29 Standard for Pad-Mounted Equipment – Enclosure Integrity for Coastal Environments, Published August 8, 2014, Revision Due date 12/31/2024

C57.12.31 Standard for Pole Mounted Equipment – Enclosure Integrity, Published September 20, 2010, Revision Due: 6/17/2020, Corrigenda approved May16, 2014

C57.12.32 Standard for Submersible Equipment – Enclosure Integrity, Reaffirmed 3/7/2008, Revision Due: 12/31/2018, PAR expiration: 12/31/2019

Old Business:

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 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.

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.

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:

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.

The test pressure should read 414 kPa (60 psig) instead of 410 kPa (60 psig)

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”.

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 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.

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

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

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[redacted]C57.12.34 – Three Phase Pad-Mount Transformers – Ron Stahara

Ron Stahara presented the following minutes from the working group meeting on March 26, 2017 at 3:15 p.m. with 86 in attendance.

Ron Stahara called the meeting to order and introductions were made. The rosters were circulated. The names of those in attendance are recorded in the AM system. To establish a quorum, a members list was displayed on the screen and those who saw their names were asked to hold up their hand. From this count of hands, it was determined that a quorum was established. The four mandatory IEEE Patent Slides dated 01/02/18 calling for Essential Patent Claims were read and no new patents were brought up. The agenda was presented and a motion to accept it was made by Jerry Murphy and seconded by Marty Rave. The motion was approved unanimously. The Fall 2017 Minutes were

presented and a motion to accept it was made by Anil Dhawan and seconded by Jerry Murphy. The group approved the motion unanimously.

Prior to this meeting, the chair asked for volunteers from the working group to help review and flesh out the Annex. The following is a list of the volunteers by section.

Annex Section	Volunteer
A.1 General	Wes Suddarth
A.2 Bails	Wes Suddarth
A.3 Overcurrent Protection	Dwight Parkinson
A.4 Under Insulating Fluid Load Break Switches	Israel Barrientos
A.4.7 De-energized Tap Changer Primary Under insulating Fluid Tap Changer Switch	Israel Barrientos
A.5 Oil Level Indication Devices	Weijin Li
A.6 Temperature Indication Devices	Weijin Li
A.7 Special Accessary Cabinets	Gary King and Rhett Chrysler
A.8 Under Insulating Liquid Surge Arrester	Israel Barrientos
A.9 Internal Current Transformers	Fred Friend and Pugal Selvaraj
a.10 Core Hot Spot Monitors	Pugal Selvaraj

During the meeting each section was presented and explained by each volunteer with the exception of Fred Friend as there was some confusion on this section. Fred stated that he would provide the internal current transformer section within two weeks. During these presentations, a couple of observations were put forth. Ali Ghafourian stated that he would recommend a general introductory comment to help explain the purpose as this annex as it being a guide to what is available and not seen what is required to be installed on each unit. Giuseppe Termini went on to state that some the items presented are directly related to safety for both the general public and personnel working on the transformers. Therefore, there needs to be enough information provided in this document so that an unsophisticated user would not make a safety related mistake in either the selection or combining of an accessory item(s). Another issue that was brought up by Brian Klaponski was the location and application of an interlocking mechanism for load break switches. He stated this when looking at the exterior accessory cabinet section and related it back to the safety of the application referred by the Ali and Giuseppe. The final item that was brought out during this discussion was a request to include in the temperature indicating device section the use of 4 – 20 mA output as well as dry contact which was currently addressed. Gary King stated that he believed that all of the figures had been changed to what had been discussed in the previous meeting but he would review them in the new draft to be sure.

In new business, Igor Simonov brought up the discussion of permanent tank deformation due to negative pressure. He stated that had seen in their company. The pictures of this were presented in the PowerPoint slide presentation and are now posted in the agenda PowerPoint PDF on the website. A motion was made by Ali Ghafourian and seconded by Marty Rave to change the verbiage in the document as shown below.

8.10.1 Strength

The tank shall be of sufficient strength to withstand a range of a gauge pressures between -5 psig (-35 kPa) to of 50 kPa (7 psig) without permanent distortion, and 103 kPa (15 psig) without rupturing or affecting cabinet security as described in IEEE Std C57.12.28.

The motion passed unanimously. Carlos Gaytan stated that he would review this section to see if this was being addressed in the new C57.12.39 and report back to the group in the Fall 2018 meeting.

The chair asked Steve Shull to develop a new draft of the standard combining the items and section changes that were put forth during the meeting. The chair requested that he provide a pdf and a DOC version. The mechanism for tracking changes will be provided and explained in the email so that changes be reviewed in the Fall 2018 meeting.

With this, the meeting was adjourned, Stephen Shull recording.

C57.12.36 – Distribution Substation Transformers – Jerry Murphy

This working group did not meet.

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

Ali Ghafourian presented the following minutes from the working group meeting on March 26, 2018 at 1:45 p.m. with 77 in attendance.

The Chair called the meeting to order at 1:45 pm.

Meeting attendees introduced themselves including consultants providing their affiliations to the Working Group. Rosters were circulated to record the meeting attendance.

The Chair called for essential patents as required using the statement provided in the general session. No essential patents were brought forward.

A quorum was established with 28 of 37 working group members present.

The agenda for the meeting was presented, and Kent Miller offered a motion with a second from Jerry Murphy to approve the agenda. The agenda was unanimously approved.

The minutes of the 2017 Fall meeting in Louisville, KY have been posted on the website since shortly after that meeting for the working group members to review. There were no suggested changes to the meeting minutes. Ron Stahara offered a motion with a second from Ed Smith to approve the meeting minutes. The meeting minutes were unanimously approved.

The Chair informed the working group members the PAR has been approved and expires in December 2021. The most recent standard was published in August 2014, and the next revision is due in December 2024.

Giuseppe Termini presented the results of responses from manufacturers to the transformer accessories survey issued by the Task Force comprised of Wes Suddarth, Craig DeRouen, and Giuseppe Termini. The survey responses showed customer demand

for various transformer accessories. The survey results are included as a separate file accompanying the meeting minutes.

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. The recommendations are included as a separate file accompanying the meeting minutes.

Mike Thibault offered a motion with a second from Jeff Valmus that a Task Force be created to provide a draft of an annex to C57.12.38 regarding all the transformer accessories included in the Task Force survey including the additional electrical and mechanical requirements specified by customers not included in the original survey. The Working Group members approved the creation of this Task Force by a vote of fourteen For and one Against the motion. The Working Group discussed the information to be included in the draft of an annex regarding transformer accessories. Recommendations included providing a general description, purpose, and installation location for the transformer accessory. Additional discussion by the Working Group cautioned about providing too much detail regarding the installation location of a transformer accessory.

Giuseppe Termini offered a motion with a second from Steve Shull for the Working Group to review and determine which electrical and mechanical requirements specified by customers not included in the original survey to be included in the draft of an annex. The Working Group members approved the motion with unanimous approval. The Working Group reviewed and determined the following be included in the draft of an annex: fault indicator provision, ground connector, HV breaker, LV breaker, under oil arrester with disconnect switch, dual voltage switch, HV bushing insert, drain valve with sampler, LV surge arrester, LV bushing screw on spade terminal or setscrew connector, welded bayonet fuse drip tray, extra parking stand, and fault indicator.

The Task Force of Giuseppe Termini, Wes Suddarth, and Craig DeRouen will be expanded to include Jerry Murphy, Steve Shull, Jim Spaulding, and Igor Simonov and develop a draft of an annex regarding transformer accessories for Working Group review at the Fall 2018 Working Group meeting.

The Task Force of Israel Barrientos, Jim Spaulding, and Mike Thibault will continue their work and develop revised Figures to increase clarity for Working Group review at the Fall 2018 Working Group meeting.

There was no new business.

The Chair announced the Working Group will meet at the Fall 2018 meeting in Jacksonville, FL.

The Chair adjourned the meeting at approximately 2:55 pm.

Submitted by: Martin Rave

[redacted]C57.12.39 – Tank Pressure Coordination – Carlos Gaytan

This working group did not meet.

[redacted]Task Force on Transformer Efficiency and Loss Evaluation – Phil Hopkinson

Phil opened with discussing the current mission of this task force being to gather loading information. The purpose of gathering this information is to ensure the industry is prepared in case of future governmental regulatory discussions. It was asked by why a member of the DOE

group was not attending these meetings, the answer was that no one precisely knows the reason but likely travel expenses not being approved. It was proposed that the Sub Committee send an invitation to the DOE shareholder. It was mentioned that Dan Mulkey was contracted by PECO to process loading data. It was asked if Jeremy Dumme (noted as DOE representative during the meeting) was an employee of Metglas and therefore had a conflict of interest. The answer was that this was not the same person that works for Metglas. Phil presented the following minutes from the task force meeting on March 26, 2017 at 9:30 a.m. with 112 in attendance.

The Chair welcomed the members to the meeting and noted that the high attendance indicted the level of interest in the topic. This was the fourth meeting of the task group. Rosters were circulated. Members were reminded of the essential patent requirements of IEEE, although as a task force to develop a database, this group would not be submitting any PARs and this this might not apply. Again as TF for data gathering and no standards are developed, a quorum verification is not required. The agenda was presented to the TF and approved as shown. The minutes of the last meeting were approved as submitted. Phil updated the group as to what utilities had submitted data.

i. PG&E

ii. So. Cal. Ed.

iii. PECO

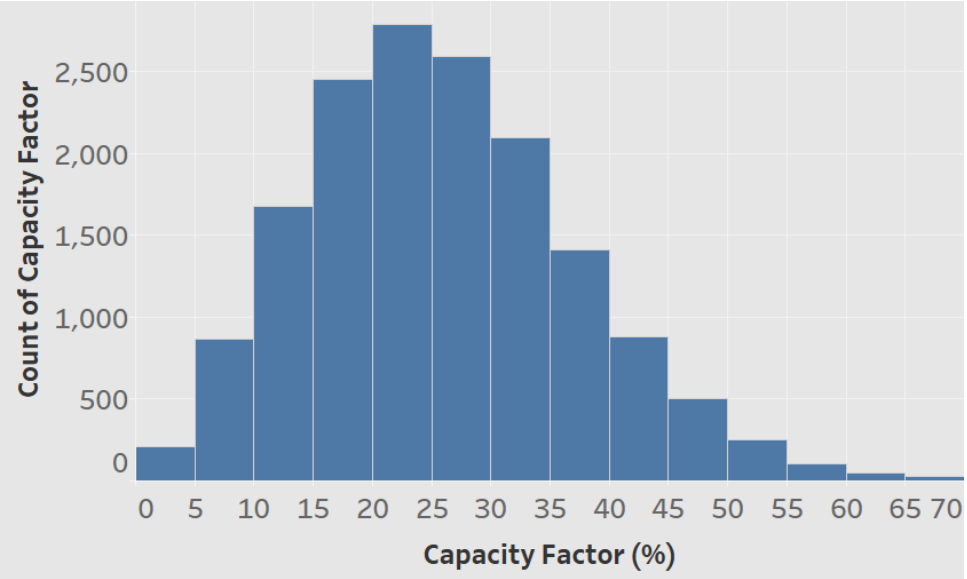
iv AEP

v DUKE

vi Con Ed

Brad Kitrell provided a summary loading data from Con Ed.

Overall Average Capacity Factor: 26%



The Con Ed data is for the period February 2017 to February 2018 for Network Transformers. For multi-banks the average Capacity Factor was 23% and for street feed it was 30%. The breakdown for Boroughs is given in the following chart:

Borough	Capacity Factor	Design
Manhattan	27%	Second
Brooklyn	28%	Second
Queens	23%	Second
Bronx	27%	First
Westchester	16%	First

Data should be available for the next meeting from Southern Cal Ed, PECO and Duke Energy. Dun Mulkey has provided templates for presenting the data and is available to assist in insuring the data is compatible.

Igor Simonov of Toronto Hydro provided a brief summary of Canadian experiences.

Phil Hopkinson reported that the DOE issued Docket #EERE-2017-BT-TP-0055, requesting comments on 15 questions had closed on November 6, 2017. Phil reviewed the comments from the 25 posted responders and summarized them in the following table:

Items	Position
DOE	Asked 15 questions
The number(s) listed in with the CO name indicates the question(s) that were responded to by the CO.	
5, 14 NEMA	Pushes for no new limits on losses
11. Powersmiths	Sees loading both light and high, recommends no changes to losses
22. NRECA	No further restrictions but WESC likes EPA program
23. Prolec	Do not change losses
24. APPA	Do not change anything
25. Howard Ind.	Do not change.
16. EEI	Sees loading increasing, wants limits on total losses
6. AK Steel	Sees increasing loads and advocates limit on total losses
3, 13 HVOLT Inc.	Summarized loading feedback and pushing for limits on total losses based on likelihood of growing future loading.
15. ACEEE +ASAP	Sees light loading and wants Testing done at lower % Load
17 Metglass	Sees light loading and wants Testing done at lower % Load
18. PG&E, SCE, SDG&E	Like IEEE Data Collection Program
8. Babanna Suresh	Wants rectifier transformers included in efficiency standard.
9. Babanna Suresh	Testing at 100% load added, clarify rectifier transformers
2, 10, 12, 19, 20, 21. Annon	Anti Global Warming comments
4. Oleh Iwanuslw	Announced a portable losses test pushing limits on core, load losses

On March 12th Mr. Hopkinson discussed the comments with Jeremy Dummu of DoE who made the following observations:

1. Comment collection completed by DOE for now

2. No public meeting planned to review comments
3. If NOPR is issued then a public meeting will be held
4. Navigant Consulting is still involved
5. Mike Rivest is still the Navigant contact.

Mr. Caskey of NEMA restated the views of the NEMA Transformer manufacturers:

NEMA strongly supports energy efficiency and represents the manufactures of numerous energy efficient products ranging from NEMA Premium Motors to LED lamps to residential and commercial energy management systems to utility distribution automation equipment.

NEMA provided the distribution transformer energy efficiency standard that became the cornerstone for the first DOE minimum energy efficiency regulation for distribution transformers, and fully supported the second round of DOE distribution transformer efficiency investigation.

At this point, the current DOE distribution transformer energy efficiency regulations are at the highest level of energy savings that maintain a healthy transformer industry in the United States. Current regulations require efficiencies from roughly 98% to over 99%.

NEMA is concerned that going to higher efficiencies for distribution transformers will reduce the number of suppliers available to provide steel inputs for transformer manufacture; particularly in light of recent tariff discussions that could negatively impact steel prices and national security.

Research has shown that testing for 35% loading for dry-type transformers and 50% loading for liquid filled distribution transformers is appropriate.

Adding an additional test at 75% load factor or applying total loss calculations will increase the burden and costs on manufacturers (and buyers) without significantly increasing the overall efficiency of new transformers.

The area for greatest efficiency improvement is to replace old transformers that were manufactured prior to the 2010 distribution transformer energy efficiency rule with transformers manufactured according to the current (2016) DOE regulation.

The next meeting will review any additional collection of data from the loading study.

Documents related to this task force can be found on the IEEE Transformer Committee website at http://transformerscommittee.org/ (under distribution transformers – TF DOE Energy eff).

The meeting was adjourned at 10.45 am

Submitted by: Phil Hopkinson

[redacted]Task Force on Distribution Transformer Monitoring – Gary Hoffman

Gary opened by presenting the motion brought forward from the task force to approve filing for a PAR. The following discussion took place:

Q: What is the difference between what this Task Force seeks to create and the existing C57.143

A: C57.143 is power and distribution has different concerns and needs.

Q: What is the thinking in relation to the smart grid

A: Assessing critical assets/applications and public safety.

Motion was unanimously approved. Gary Hoffman will be the chair. Gary presented the following minutes from the task force meeting on March 27, 2018 at 4:45 p.m. with 61 in attendance.

Steve Shull called the meeting to order. Steve explained this was the first meeting of this Pre-PAR study group on Distribution Transformer Monitoring. Steve stated that he had assigned Gary Hoffman as the Working Group Chair. Mike Thibault was appointed by Gary to be Secretary. Gary asked that the group introduce themselves. Steve Shull and Mike Thibault started the circulation of the rosters. Garry explained to the group since this was the first meeting everyone had the opportunity to become members. If a person so choses, please note this on the roster as it is circulated. Gary explained that this group is enabled to operate in it present state for six months. During this time we need to determine what type of document that we would like for this to be. Gary explained that documents labeled as "standards" include items that direct the design of the performance and sometimes interchangeability details of products they address. "Recommended practice" documents provide directions to the user in the form of should statements to the address the way the product or test should be administered. Guides provide an overall direction and typically use the word "may". Gary also explained that it was critical that we obtain a PAR because without this we can not do any work because as a group will not indemnified. So based on this discussion, Gary proposed a title to the group. After a discussion, the following was proposed developed.

Title for Document – "Guide for Monitoring Distribution Transformers"

A motion was made by Raka Levi and seconded by James Dorsten to accept this as our document title. Of the group 50 were in favor, 9 opposed and 1 abstained. The motion passed.

Gary explained that the next step would be to determine the Scope of the Guide. There was a lot of discussion as to if there should be Online and Offline Monitoring. It was generally agreed that these should be discussed as the document was developed as long as these items remained in the scope that we craft. After some discussion the group agreed to the following scope wording.

This guide covers identification of the key measureable parameters that can be monitored for obtaining an indication of the condition of liquid-immersed distribution transformers.

There was some concern that this would not include submergible transformers which are distribution transformers. A motion was made to send this title and scope to the STNP subcommittee to seek their co-sponsorship. This motion was made by Steve Shull to accept the scope as presented and to seek the co-sponsorship of the STNP subcommittee. It was seconded by Said Hachichi. The motion passed with 32 "for",

10 “against”, and no abstentions. Mike Thibault volunteered to do this in the STNP subcommittee meeting.

Gary said that the next item was to determine if a Purpose of the document should be crafted. He explained that this was not really necessary and the majority of the documents do not include them. Again some discussion but in the end the group decided not to formulate this item. Steve Shull made a motion not to develop a purpose for this document. It was seconded by James Dorsten. The motion passed unanimously. Gary will submit a PAR request for this TF. Jim Graham will survey the AdCom of the Transformer Committee to determine their direction. Once this is completed and approval is gained, the PAR application will be submitted to NesCom. It was projected that this would be done by the July NesCom meeting date.

Submitted by: Mike Thibault

C.3 Old Business

- None

C.4 New Business

- Ron Stahara wanted the group to recognize Phil Hopkinson and Craig Colopy for their tenure of service.

- Phil Hopkinson brought up continued issues with Core Gassing. He noted that PCS did work previously on publishing instructive material to mitigate core gassing but was too late for 2015 editions of C57.12.00 and C57.12.90. He also noted that this was an issue on >= 15 kV Lo-High coil construction with wound cores.

  Dan Sauer noted a concern with requiring PD testing on very small transformers

  The Chair encouraged the Sub Committee to attend the working groups and task forces working on this issue.

  Dan Sauer noted that there were often time slot overlaps with Distribution meeting and Dielectric test subcommittee meetings.

- Phil Hopkinson brought up continued issues with solar farm inverters interacting with transformers resonance between components of the transformer.

  Dan Sauer asked what was considered the “incoming” in this scenario, it was clarified that the “incoming” was between the inverter and the transformer.

  Weijin Li asked why a floating Y was used in lieu of a Delta, the answer was not known.

  Phil asked if a solar transformer provision should be added to the Distribution SC.

C.5 Chairman’s Closing Remarks and Announcements

Steve had no closing comments to the SC except to see them in Jacksonville in fall of 2018.

C.6 Adjournment

Steve adjourned the meeting as provided in the meeting agenda at 10:15am.