

# Annex M Subsurface Transformers & Network Protectors Subcommittee

May 6, 2017

New Orleans, Louisiana

Chair: Dan Mulkey

Vice Chair: George Payerle

## M.1 Meeting Administration

**Introductions** – The meeting was called to order at 11:00 AM Wednesday, April 5, 2017 in the Toulouse AB room of the Astor Crowne Plaza Hotel in New Orleans, Louisiana. Introductions were made and sign-in sheets were routed. In the chair's absence, George Payerle ran the meeting and Giuseppe Termini acted as secretary.

Chairman's Comments –.

**Membership Changes** – At the Vancouver meeting, Jermaine Clonts, Mark Faulkner, and Kwasi Yeboah requested and were accepted as members. Prior to this meeting, Adam Bromley, Justin Pezzin, and Anastasios Taousakis (Taz) announced that they would no longer be attending and have resigned from the subcommittee. We wish them well in their new endeavors and we will miss their input at these meetings.

**Quorum** – The members were listed on the screen and by a show of hands, it was determined that there was a quorum in attendance.

**Members and Guests** --There were 18 members and 25 guests in attendance. Their names can be found in the AM system. Nine guests requested membership.

**Approval of Minutes** – The minutes from the Fall 2016 meeting in Vancouver, BC, Canada were approved. They were motioned for approval by Brian Klaponski and seconded by Cory Morgan. The subcommittee approved these without opposition.

## M.2 Working Group and Task Force Reports

### M.2.1 C57.12.23 Working Group Report – Single-Phase Submersible Transformer

Alan Traut, Chairman, Jermaine Clonts, Secretary.

Revision Due Date: **3/19/2019**

PAR Approval Date: **8/21/2014**

PAR Expiration Date: **12/31/2018**

Introductions – The meeting was called to order and everyone was asked to introduce themselves. Paper rosters were sent around in addition to asking for all attendees to scan their badge.

At the start of the meeting the working group was asked to disclose of any essential patent claims. No essential patent claims were disclosed

Quorum – We had 68 attendees, 25 members present out of 34 active members, which gave us enough members to establish a quorum.

Approval of agenda - unanimous approval of agenda

Approval of meeting minutes- unanimous approval of meeting minutes

Chair Report – Al talked about when the PAR expires and how long we have to complete our work. PAR expires December 31, 2018. 10-year life cycle of the standard is December 31, 2019. Al informed the

working group of his desire to send to the ballot in the spring meeting of 2018, which would give us two more meetings.

#### Old Business

##### 1. Tank Materials

Jermaine Clonts reviewed the results of the minimum material thickness survey. The survey was sent to all 34 members. 8 responses were received from a mix of OEM's and end users. One end user recommends the use of copper bearing steel and one manufacture responded with requirements for 409 stainless steel. All other responses were for 304L and 316L stainless steel with the 16-gauge steel being the minimum value received for auxiliary coolers, 14 gauge was the minimum thickness for the tank wall and 13 gauge was minimum value received for the cover and tank bottom. The table was populated during the meeting with the minimum value received from the survey with 409 stainless steel being one gauge thicker than 304L and 316L stainless steel except for the auxiliary coolers. After discussion around the basis for the data presented, the following note was added "this table was developed for round tank construction with the intent to specify the minimum thickness for corrosion resistance. Thicker material may be needed for rectangular tank construction or other mechanical requirements. "Al Traut and Jermaine Clonts agreed to finalize the table with consideration to the industry tolerances on the base materials and consideration to specifying the requirements in gauge versus inches/mm. The finalized table is to be reviewed at the fall 2017 meeting. Brian Klaponski made a motion to accept the table as listed with the note included Ronald Stahara seconded the motion

##### 2. Low Voltage terminals 7.2.2

Al Traut led the discussion with the comment that other transformer standards define the minimum low voltage bushing stud size by kVA. In addition, some end users questioned what stud size they should specify for their transformers. Based on the previous comments Giuseppe Termini and the working group agreed we should include the table defining the minimum stud size by kVA in the standard.

Discussion took place around the type of bushing typically used in the industry, Brian Klaponski mentioned a design in past with a cable sent all the way through the bushing. Ed smith commented that the industry standard is a threaded copper stud surround by molded epoxy. Brian Klaponski commented when constructing the table for the bushing stud sizes consider a 200 % overcurrent requirement. Bill Wimmer, Ed Smith, and Josh Verdell agreed to propose a table for review in the fall 2017 meeting defining low voltage bushing stud size by kVA.

The group ran out of time and placed the review of the final minimum material thickness table and the low voltage bushing stud size table on the agenda for next meeting. We adjourned at 10:40 AM. We will meet at the Fall 2017 meeting in Louisville, Kentucky

#### **M.2.2 C57.12.24 Working Group Report – Three-Phase Submersible Transformers**

Giuseppe Termini, Chairman; George Payerle Secretary

Approved: **12/7/2016**

Revision Due Date: **12/7/2026**

PAR Approval Date:

PAR Expiration Date:

The meeting was called to order at 9:30 AM in the Toulouse AB room at the Astor Crown Plaza in New Orleans on Monday, April 3, 2017. Introductions were made and an agenda was presented. The meeting was attended by 16 members and 35 guests. Membership stands at 25 and with 16 members present, there was a quorum. Thirteen guests requested membership. The chairman asked if there were any patent claims. There were none.

George Payerle acted as recording secretary. Since this group did not meet in Vancouver, the minutes of the spring 2016 meeting in Atlanta were presented. Corey Morgan made a motion to approve the meeting minutes, Kent Miller seconded the motion and it was unanimously approved.

The standard was officially approved on December 7, 2016 and will expire in December 7, 2026. The Chair expressed gratitude to everyone who worked on the standard revision. The Chair stated that a new Project Authorization Request (PAR) needs to be initiated in order to start work on the next revision. A PAR is good for 4 years. The chair suggested taking a 3 year (6 meetings) break before beginning to work on a new revision.

Brian Klaponski stated the need to maintain continuity and suggested to meet in the fall of 2017 to plan topics for the next revision. One topic Brian suggested was the tank material requirements and the use of stainless steel. He mentioned that according to a material expert, the tank material requirements in the standard could be improved. Lee Welch also suggested maintaining continuity so that work on a standard would be uninterrupted. The continuity on the standard would make it easier for utility personnel to continue attending the WG meetings.

After a prolonged discussion on when to hold the next meeting, a suggestion was made to meet as a task force and hold an off schedule meeting to plan the next revision. Greg Anderson suggested taking a break in order to clear a spot in the schedule for other meetings. Anil Dhawan made a motion to take a 1 year (2 meetings) break before starting on a new revision. Said Hachichi seconded the motion. The members voted, and the motion was approved. The next official meeting of C57.12.24 was set for the fall of 2018. In the meantime, the Chair proposed to solicit input from the WG members, via email, on whether or not to meet off schedule in the fall 2017 as a task force to plan the next revision of the standard.

The meeting was adjourned at 10:50 AM.

**Respectfully Submitted by:** Giuseppe Termini, Chairman C57.12.24 Working Group

### **M.2.3 C57.12.40 Working Group Report – Secondary Network Transformers**

Brian Klaponski, Chairman; Giuseppe Termini, Secretary

Revision Due Date: **12/31/2021**

PAR Approval Date: **8/30/2012**

PAR Expiration Date: **12/31/2017**

Stage: Submitted to Revcom

RevCom Agenda 04-May-2017

- 1) The WG met on Tuesday, April 4, 2017 at 11:00 am with 12 members and 37 guests. Requests for membership came from 15 guests.
- 2) An agenda was presented and approved; and introductions were made.
- 3) The Chairman asked if anyone in the Working Group knew or had knowledge of any existing or pending patents that may affect the work on this standard. There was no positive response.
- 4) The minutes of the October 25, 2016, meeting in Vancouver BC, Canada were reviewed.
- 5) Jeremy Sewell made a motion to approve the Meeting Minutes. Cory Morgan seconded the motion and the minutes were approved unanimously.
- 6) The Chairman stated that the standard was recirculated for re-balloting after the two negative comments were resolved. The recirculated standard was successfully approved.
- 7) One of the negative comments dealt with tank corrosion and was rejected since it was impractical to consider it in a timely manner before the standard was published. The

Chairman stated that there was validity in investigating the issue brought up by the negative ballot and suggested that this topic should be addressed in the next revision of this standard.

- 8) The Chairman stated that the standard has been submitted to RevCom for their May 4, 2017 meeting. He expects that our new revised standard will be officially published in 2017.
- 9) Under new business, the Chairman stated that the WG will keep working on the next standard revision probably under a Task Force format. The Chairman suggested we investigate several topics starting at the next meeting at the next WG upcoming Fall meeting in Louisville, KY. After that investigation we would apply for a PAR (perhaps in 2018) to begin the next revision. Some of the topics for the next revision are:
  - a) Tank corrosion
  - b) Location of the primary disconnect and grounding switch within the network transformer
  - c) Cathodic protection
- 10) The Chairman stated that representatives from ConEd had agreed to make two presentations starting with our Fall meeting:
  - a) Placement of the network switch within the network transformer and the reasons why.
  - b) Cathodic protection used in the ConEd system for network transformers.
- 11) The meeting was adjourned at 11:50 am with the next meeting set for Louisville, KY in October 2017.

Respectfully submitted  
B. Klaponski, Chairman

#### **M.2.4 -C57.12.44 Working Group Report – Secondary Network Protectors**

Mark Faulkner, Chairman, Alex Macias, Secretary  
Revision Due Date: **12/31/2024**  
PAR Approval Date: **3/26/2015**  
PAR Expiration Date: **12/31/2019**

#### **Meeting Administration:**

- The meeting was called to order at 1:45 PM
- Essential Patents Disclosure
  - *None cited*
- Attendance
  - *Rosters passed out*
  - *Roster Scanned and Sent to DHM*
- Introductions
- Quorum Determination
  - *A total of 26 individuals attended the meeting. Membership stands at 10; members present 5, a quorum was met on people in attendance*

- *Those that have requested membership and have attended two consecutive sessions will be members at next meeting.*
- Approval of the last meeting minutes
  - *Mark Faulkner presented the meeting agenda to the WG for review and acceptance. Charles (Cory) Morgan motioned to approve the meeting agenda as presented, Doug Craig, seconded the motion, the motion was approved unanimously. No one opposed.*

### Items Discussed during meeting:

Mark Faulkner announced that a Draft ( 1 ) will be routed to Group/Members to review changes made from the previous meetings. Responses to be presented at the next meeting.

#### 1<sup>st</sup> Item – External Fusing Height

Group/members approved not to include any reference to Heights

- Drawings were received from Eaton and Richards on terminator pads.
- Discussion held between the differences between EATON and Richards terminator mounting pads for terminals prior to making decision on figure notation.

#### 2<sup>nd</sup> Item – Spades 11.5.7

Four drawings were presented reflecting EATON and Richards spades

- Drawings were all eight holes; Lee Welch inquired about 6-hole pattern. Mark Faulkner commented that Westinghouse had 6-hole pads but were changed to 8 holes later.
- Eight holes to be kept, no request made to include the historical 6-hole pattern.
- Group /members requested descriptions be added with respect to ratings and secondary voltages (i.e. Figure 7)

#### 3<sup>rd</sup> Item – Spade Type

- Lee inquired about the need to add type of material and plating to the terminals.
  - o Copper- Silver or Tin plated
- Group/members approved to include information into the spec

#### 4<sup>th</sup> Item – 500kVA Losses : F3 annex paragraph 5

Brian Klaponski stated the paragraph is correct as noted.

- Group/Members (Mark Faulkner motion, Cory Morgan 2nd) not to make any changes, approved.

#### 5<sup>th</sup> Item – Remote Racking Section 9

- This will be tabled for future revisions/changes submittals (i.e. PAR)
  - o Define
  - o Write up
  - o Include viewing windows “as specified by end user”

#### 6<sup>th</sup> – Section 10.5.3 Inspection Window

Group/Member concurred this needs to be rewritten

- Doug Craig (Richards) to email a rewritten sentence based on his version verbally stated

#### 7<sup>th</sup> – Define “Dry Contact”

- Suggested to be “no voltage”
- Group/Members accepted

8<sup>th</sup> - Windows for remote racking

Discussion held about the need to include or remove

- Group/Member held open discussion for keeping in the spec.
- Also discuss its construction requirements
  - o Igor Simonov commented that the IEEE standard C37.20.2 from Switchgear should be obtained and reviewed for possible reference notation in this section.
  - o This spec will address Group/member concerns

9<sup>th</sup> – Lee Welch commented that should the WG consider DG (distributed generation) clause in standard. Group/members accepted to make reference only of C1547.6 in Annex

10<sup>th</sup> – Table B4

#3 & #4 amp rating were changed

- Group/Member accepted

11<sup>th</sup> – Mark Faulkner motioned to remove the term Solid State and replace with Digital for the relay references.

Group/members accepted to change to the term “micro-processor”

12<sup>th</sup> - Section 6.1.1.2 Voltage Test Min.

Pedro Salgado and Doug Craig volunteered to review this section and forward a proposed re-write to define and clarify min. voltage and trip percentages verbiage.

**Next meeting:** Louisville, KY

**M.3 Old Business**

None

**M.4 New Business**

Brian Klaponski suggested to have Dan Mulkey to explain the rationale for changing the SC title to Subsurface Transformers & Network Protectors Subcommittee at the next SC meeting in Louisville, KY.

There was a discussion led by Brian Klaponski regarding the future course of 12.40. While we voted at the 12.40 meeting to take a 1 year (2 meeting) break before requesting a PAR, Brian wants to have a meeting slot at the Louisville and Pittsburgh meetings to informally discuss the items that we should consider in the next revision. Greg Anderson strongly does not want to assign a slot to 12.40 since the standard is complete.

Al Traut stated that it was his understanding that a working group has a two meeting time frame where the group can meet and prepare for a new PAR. In the case of 12.40, Brian has ConEd preparing a presentation for the fall of this year and may also consider having a corrosion expert make a presentation to the group in the near future

Greg says he will assign a room for an off schedule meeting but Brian felt that was not an effective way to get people to show up. Giuseppe stated that inviting people to an off schedule meeting is a further administrative task that we don't need and it would be easy for people to do other things instead attend such a meeting.

**M.5 Adjournment**

The meeting was adjourned at 12:00 PM with the next meeting set for Louisville, Kentucky on November 1, 2017.