

## **Annex H    Insulation Life Subcommittee**

**April 5, 2017**

**Astor Hotel, New Orleans, LA**

**Chair: Sheldon Kennedy**

**Vice-Chair: Barry Beaster**

**Secretary: Sam Sharpless**

The Insulation Life Subcommittee was called to order by the Chair in New Orleans, Louisiana on April 5, 2017 at 8:11 AM. Due to the size of the group, general introductions were not made. The Chair requested that each person state their name and affiliation when addressing the subcommittee.

### **H.1    Chair's Report/Remarks**

The chair provided the dates of upcoming TC meetings as follows;

2017 Fall Meeting; October 29-30, 2017, Louisville, Kentucky, USA

2018 Spring Meeting; March 25-29, 2018, Pittsburgh, Pennsylvania, USA

2018 Fall Meeting; October 14-18 or 21-25, 2018, location to be determined.

The Chair requested that any person with knowledge of a patent essential to meet the requirements of any subcommittee standard to bring the issue forward for discussion. No one responded to this request.

The Chair requested the following items be included in all activity group minutes;

- The name of the activity
- The date and time of the meeting
- The number of members and guests in attendance. Full attendance should be recorded in the AMS system
- The presence or absence of a quorum
- Any essential patent issues raised during the meeting.
- A summary of discussion. Intricate detail not required. Use a separate document to explain decisions that are made.
- A record of the decisions made in the meeting
- If there will be another meeting. If so, state the time and place.
- Submit minutes as soon as possible, but no more than 15 days after the meeting.

The Chair reminded everyone that working groups must achieve a two-thirds majority to submit a document for Sponsor Ballot. The subcommittee must achieve a simple majority to submit a document for Sponsor Ballot.

The Chair discussed the membership requirements and recognized the following new members;

- Victor Garcia
- Weijun Li
- Juliano Montanha
- Marcos Ferreira
- Klaus Pointner
- Jimmy Rasco
- Alan Sbravati
- Hamid Sharifnia
- Ismail Guner
- Vladimir Abril
- Ali Naderian

The Chair discussed the requirements for continued membership and stated that the following members had been moved to guest status;

- Kiran Verdante
- Jerry Reeves
- Alvaro Portillo
- Jose Valencia
- Zoilo Roldan
- Keith Ellis

The Chair noted that the following guest had been removed from subcommittee rolls by request;

- David Harris

The Chair reported on the status of subcommittee Projects;

- C57.91 - IEEE Guide for Loading Mineral Oil-Immersed Transformers; C57.91 is valid until 2021.
- C57.100 - IEEE Standard Test Procedure for Thermal Evaluation of Liquid-Immersed Distribution Transformers; C57.100 is valid until 2021.

- C57.119 - IEEE Recommended Practice for Performing Temperature Rise Tests on Oil-Immersed Power Transformers at Loads Beyond Nameplate Ratings; C57.119 is valid until 2018. The working group chair for revision of this document is Gael Kennedy.
- C57.154 - Design, Testing and Application of Liquid-Immersed Transformers with High-Temperature Insulation; C57.154 is valid until 2022.
- C57.162 – Guide for the Interpretation of Moisture Related Parameters in Dry, Gas Insulated and Liquid Immersed Transformers and Reactors; The C57.162 PAR expires December 31, 2017. The standard is valid until 2018. The working group chair for revision of this document is Thomas Prevost.
- 1276 – Guide for the Application of High Temperature Insulation Materials in Liquid-Immersed Power Transformers; The 1276 PAR expires December 31, 2016. The standard is valid until 2018. A PAR extension has been requested. The working group chair for revision of this document is Roger C. Wicks
- 1538 – IEEE Guide for Determination of Maximum Winding Temperature Rise in Liquid-Filled Transformers; 1538 is valid until 2021. Amendment approved September 2015. working group chair for revision of this document is Richard P. Marek.

### H.2 Secretary's Report

The Secretary reported that according to the electronic check-in system, 64 of 109 members were present at the start of the meeting and that a quorum had been achieved.

The Fall 2016 subcommittee meeting minutes was provided to participants in advance of the meeting for review. Mr. Pat McShane stated that his post-meeting comments included in the minutes were in error and requested that the first sentence of his last point be deleted. The amended minutes were then approved with no objections.

The Spring 2017 subcommittee meeting agenda was provided to participants in advance of the meeting for review. The agenda was approved with no objections.

The Chair presented the agenda for the current meeting. Stephen Antosz noted that a representative the Chinese Society of Electrical Engineers desired to address the group and requested that they be placed on the agenda as new business and the Chair agreed to do so. Sanjib Som made a motion to approve the amended agenda. Don Ayers seconded the motion and there was unanimous approval.

Consolidation of the electronic check-in records and the written attendance rosters after the meeting provided the following final attendance totals;

|               |     |
|---------------|-----|
| Total Present | 234 |
| Members       | 76  |
| Guests        | 105 |

Eight guests requested membership via the membership roster.

The following requestors met the membership criterion;

Jose Gamboa

Saurabh Ghosh

Jinesh Malde

Mickel Saad

Robert Thompson

Jason Varnell

Michel Veillette

The following requestors did not meet the membership criterion as of this meeting;

James Thompson

### **H.3 Project Status Reports**

#### **H.3.1.1 C57.91 IEEE Guide for Loading Mineral-Oil-Immersed Transformers**

C57.91 is valid until 2021.

#### **H.3.1.2 C57.100 IEEE Standard Test Procedure for Thermal Evaluation of Liquid-Immersed Distribution Transformers**

C57.100 is valid until 2021.

#### **H.3.1.3 C57.119 IEEE Recommended Practice for Performing Temperature Rise Tests on Oil-Immersed Power Transformers at Loads Beyond Nameplate Ratings**

C57.119 is valid until 2018 and is Chaired by Gael Kennedy.

#### **H.3.1.4 C57.154 Design, Testing and Application of Liquid-Immersed Transformers with High-Temperature Insulation**

C57.154 is valid until 2022.

#### **H.3.1.5 C57.162 - Guide for the Interpretation of Moisture Related Parameters in Dry, Gas Insulated and Liquid Immersed Transformers and Reactors**

The C57.162 PAR expires December 31, 2017. The standard is valid until 2018 and is Chaired by Tom Prevost

#### **H.3.1.6 1276 Guide for the Application of High Temperature Insulation Materials in Liquid-Immersed Power Transformers**

The 1276 PAR expires December 31, 2016 and an extension has been requested. The standard is valid until 2018 and is Chaired by Roger C. Wicks.

### **H.3.1.7 1538 IEEE Guide for Determination of Maximum Winding Temperature Rise in Liquid-Filled Transformer**

The 1538 guide is valid until 2021 and is Chaired by Richard Marek. An amendment was approved in September 2015.

### **H.3.2 Working Group and Task Force Reports**

#### **H.3.2.1 Working group on PC57.162 – Guide for the Interpretation of Moisture Related Parameters in Dry, Gas Insulated and Liquid Immersed Transformers and Reactors – Tom Prevost**

April 3, 2017

The meeting of the PC 57.162 Guide for the Interpretation of Moisture Related Parameters in Dry, Gas Insulated and Liquid Immersed Transformers and Reactors (Moisture in insulation systems) Working Group was held on April 3, 2017.

|            |                              |              |
|------------|------------------------------|--------------|
| Attendance | Members                      | 51 out of 81 |
|            | Guest                        | 77           |
|            | Guests Requesting Membership | 11           |

The chairman skipped introductions in order to save time and established a quorum.

A quorum of the working group members were present (51 out of 81).

Approval of agenda and then approval of minutes with minor corrections in Task Force 4 belongs in Task Force 10.

The chairman then asked for notification of any essential patents related to the group's work. None were stated.

The chairman briefly described the working plan. The Par is allotted 4 years and the time is about up. The chairman discussed the need to ask for a PAR extension.

The meeting started with the purpose and scope of the WG.

The chairman asked about the need to address sealed dry types and it was determined that this was not in scope.

The task force leaders then updated the WG on the progress of their respective task forces. The chairman asked for any information from the Task Force leaders so the Secretary can start to assemble the document.

Task Force 1 Terminology and Definitions

Task Force Leaders - Jeff Golarz golarz@aol.com

Jeff Golarz has a list compiled from folks that has sent to him.

### Task Force 2 Measurement and evaluation of moisture-in-gas insulation parameters

Task Force Leaders - Tom Melle tom.melle.us@ieee.org

Tom Melle stated that the dew point as referenced C57. 93 is outdated. He had asked for industry for help and is now looking at relative humidity instead. The Chairman mentioned to be careful not to add research into the standards. Tom Melle injected that there are some papers for verification. The team will have to use best practices for dew point. This information which goes back to 1946 and is outdated.

### Task Force 3 Measurement and evaluation of moisture-in-liquid insulation parameters

Task Force Leaders- Claude Beauchemin beauchemin@tjh2b.com

The chairman has spoken with Claude and still needs a lot of work.

### Task Force 4 Measurement of moisture in solid insulation

Task Force Leader - Paul Griffin pgriffin@doble.com/ Ronald Hernandez

They are basically done with the task.

### Task Force 5 Evaluation of moisture in solid insulation using dielectric response methods

Task Force Leader - George Frimpong george.k.frimpong@us.abb.com

The task force is done.

### Task Force 6 Inferring of moisture in solid insulation from measurements conducted in liquid or gaseous medium

Task Force Leader - Valery Davydov valery.davydov@ieee.org

The draft has been distributed and proceeding very well.

### Task Force 7 Evaluation of aging and end of life of solid insulation parameters

Task Force Leader- Roger Wicks roger.c.wicks@usa.dupont.com

Roger has promised an initial draft soon

### Task Force 8 Factory/workshop application of knowledge on moisture; establishing baselines

Task Force Leader - Poorvi Patel poorvi.patel@us.abb.com

This task force is done.

### Task Force 9 Field application of knowledge on moisture

Task Force Leader – Jim Thompson [serve1@svtv.com](mailto:serve1@svtv.com)

\* Note: This section lists the risks associated with moisture

Jim has a quick update presentation, in the past proposed a excel spreadsheet and wasn't working and he has taken some information for his company to come up with some data but it not complete. He is seeking anyone that can assist him with supplying him with industry data.

### Task Force 10

Leader – Bruce Forsyth

This task force has been added half way through the working group. They have put together a scope for the task force. The chairman requested Bruce to resend it to him again.

Meeting adjourned.

### **H.3.2.2 Working Group for Application of High-Temperature Materials IEEE P-1276 – Roger Wicks**

Sheraton Hotel – Vancouver, BC Canada  
Room – Grand Ballroom AB  
October 25, 2016, 3:15 - 4:30pm

#### A. Welcome & Chairman's Remarks

R. Wicks

Roger opened the meeting at 3:15pm with a brief description of the scope of the Working Group. The chair reviewed the patent topic and there were no essential patented described for work in the area of this standard.

#### B. Circulation of Attendance Rosters

J. Arteaga

Circulated

#### C. Attendance for Quorum

J. Arteaga

19 members were in attendance meeting the quorum requirement of 18 members. The attendance will be reviewed and new members will be added if they meet current attendance requirements. The attendance will be recorded in the AMS system. The automated attendance records (scanning system) recorded 19 members and 60 guests.

#### D. Approval of Spring 2016 Meeting Minutes – Atlanta, GA

J. Arteaga

Mike Shannon made a motion to approve the minutes as written, John Luksich seconded it and these were unanimously approved without changes.

### E. Approval of Meeting Agenda

R. Wicks

Eduardo Tolcachir made a motion to approve the agenda as written, Mike Shannon seconded it and these were unanimously approved without changes.

### F. Status of PAR/Document

R. Wicks

The PAR of this standard was requested for extension for 2 year. The standard expires at the end of 2018.

### G. Assignments from Last Meeting

R. Wicks

The assignments for the elaboration of the draft are as follows. Chair requested groups to complete the draft work before the end of year.

Section 5 – Insulation-system temperature ratings, test procedures, and material aging qualification:

Chair - Roger Wicks

Volunteers – Mike Franchek, Ken McNeish, Tom Golner, David Stankes, Solomon Chiang, Joshua Verdell, Dave Sundin, Jinesh Malde, and Mohamed Diaby.

Section 6 – Insulating Materials.

Chair – Javier Arteaga

Volunteers – Clair Claiborne, Julio Caldeira, Patrick McShane, Dave Sundin, Attila Gyore, Chuck Stevens, Shane Goydich, Jinesh Malde, Dustin Davis, and Mike Shannon.

Section 7 – Description of high-temperature transformers.

Chair – Mike Franchek

Volunteers – Kurt Kainerder, Arup Chakraborty and Evan Langran.

Section 8 – Loading guidelines for high-temperature transformers.

Chair – John Luksich

Volunteers - Arup Chakraborty and Jinesh Malde

Section 10 – Heat run test and average winding temperature.

Chair – Juan Castellanos

Volunteers – Mike Franchek, Alan Sbravati

### **H.3.2.3 Working Group on C57-119 IEEE Recommended Practice for Performing Temperature Rise Tests on Oil-Immersed Power Transformers at Loads Beyond Nameplate Ratings – Gael Kennedy**

The document is undergoing ballot resolution. It is still on track to be completed prior to the end of 2018. This working group did not meet during the Vancouver Conference.

Submitted by: Gael R Kennedy

## **H.4 Old Business**

The chair stated that the Chinese Society of Electrical Engineers “Standard for lead exits, 1000 volts and above”, has been referred elsewhere by the and will therefore not be addressed by this subcommittee.

Regarding the work of the “C57.154 Annex B Clause B.5 Recommendation” working group;



- Mr. Rick Marek provided a presentation explaining his concern that thermal class data in C57.154-2012 Annex B regarding cellulose in ester was based upon insufficient data. He agreed that the data shows some improvement of temperature life improvement, but that the specific level of improvement has not been established.
- Mr. Alan Svarti provided a presentation supporting the C57.154-2012 Annex B data. He presented a case that the data in Annex B is sufficient to establish curves which support the thermal classes indicated. He provided data points from unpublished data which was consistent with the data extrapolations in Annex B.
- Mr. Roger Thompson, chair of the subject working group, provided a summary of the working group's meeting and reported the working group's recommendation to form a task force to review annex B for possible amendment. He then made a motion as follows; "A new task force be formed to review the Annex for possible amendment". The motion was seconded by Mr. Tom Prevost.
- Mr. Svarti and Mr. Patrick McShane spoke against the motion. Mr. Thompson and Mr. Prevost spoke for the amendment.
- Mr. Thompson amended his motion as follows; "A new task force be formed to review Annex B of C57.154 for possible amendment". Prevost seconded the amended motion.
- A vote of members was taken and the motion was approved with 57 yes, 3 no, and 1 abstention.
- The Chair asked that anyone desiring membership in the new working group notify him so that work can begin promptly.

### **H.5 New Business**

Mr. Phil McClure stated that C57.165 now has an approved PAR. He is the chair of the working group and requested that interested others contact him.

### **H.6 Adjournment**

Mr. Phil McClure made a motion for Amendment. Gail Kennedy seconded and there were no objections.

Respectfully submitted,

Samuel L. Sharpless  
Secretary, Insulation Life Subcommittee