

Annex G Insulating Fluids Subcommittee

**October 30, 2019
Columbus, OH**

**Chair: David Wallach
Vice-Chair: Jerry Murphy
Secretary: Scott Reed**

G.1 Introductions, Roll Call of Members for Quorum, Meeting Agenda Approval, S19 Minutes Correction and Approval, and Chair's Comments

G.1.1 Chair's Opening Remarks:

- a. When balloting, the resulting document must be reviewed and approved by the WG with majority approval after comment resolution is complete before recirculation.
- b. Reminded that the WG and TF meeting minutes are due for submittal to the Insulating Fluids Subcommittee (IFSC) Secretary Scott Reed due within 15 days of their meetings.

G.1.2 Roll Call of SC members: (Quorum requirement: 21 minimum)

- a. 31 Members signed in. Quorum was achieved.
- b. 36 Guests attended, and 5 who were eligible, requested membership.

G.1.3 Agenda Approval:

- a. A motion was made by Kent Miller and seconded by Kumar Mani to approve the agenda. The agenda was approved unanimously without objection.

G.1.4 Approval of minutes from the S19 meeting in Anaheim, CA:

- a. A motion was made by Alan Sbravati and seconded by Don Dorris to approve the minutes. The minutes were approved unanimously without objection.

G.1.5 Chair's review of key SCIF Standards:

- a. The chair reviewed the status of each guide under the Sub-Committee Insulating Fluids. C57.111 and C57.121 are up for review but they will be superseded by C57.166 so these PARs will not be renewed. C57.147 has nine years remaining until its expiration, but will also be replaced by C57.166.
- b. C57.637, C57.106, C57.130, C57.139, and C57.155 all have PARs that will expire in 2024 or beyond so no activity is required at this point.
- c. C57.104 was in publishing and was expected to be release soon.

G.2 WG & TF Reports Presented at the SC Meeting

G.2.1.1 IEEE C57.166 Consolidation of Insulating Liquids Guides (PAR Expiration: Dec 2022)

WG Chair: Tom Prevost

The report of the WG Meeting was presented at the SCIF meeting by Tom Prevost:

- a. The WG meeting had 83 attendees. Of these, 29 of 37 members were present so a quorum was achieved.
- b. Five Task Forces chairs each gave a status report of their respective sections. TF1 did a comprehensive review of liquids that are new, prior to energization and shipment new fluids. The section is essentially completed. Some discussions on how the table are structured. Peter Balma made a comment about normative references to make sure what is listed is only what is required. TF2 has developed the tables for in-service fluids. D877 is being removed from the guide but need to define voltage class for LFH. TF3 presented its first draft. TF4 draft is starting to be worked on. Question is whether or not Oil reclamation in TF4 will supersede 637. The concern is 637 will reference C57.106 and not C57.166. Tom will reach out to Jim Thompson to discuss. Scott Reed, Stephanie Denzer and David Sundin will assist in reviewing the guide to determine whether it should be included as part of TF4. A recommendation will be made to the Subcommittee at the Charlotte meeting. TF5 used different voltage classes so it will be discussed at the next working group meeting under ‘New Business.’

See *Appendix II* for the F19 Minutes (unapproved) of C57.166 WG Meeting as submitted.

G.2.1.2 IEEE C57.146 IEEE Guide for Interpretation of Gasses Generated in Silicone-Immersed Transformers (PAR Expiration: Dec 2022)

WG Chair: Deanna Woods

Deanna Woods was unable to attend the meeting:

- a. Jim Graham reported that no PAR request made regarding this guide and no TF meeting occurred in Columbus. Since the Chair of the Working Group needs to initiate a PAR request, to eliminate further delays, it was suggested that Jon Karas take over as Chair of the Working Group. Jon accepted and will initiate the PAR request.

G.3 Old Business

No Old Business to review.

G.4 New Business

- a. Claude Beauchmin requested to establish a C57.104 Study Group. He gave a presentation supporting the need to document topics for consideration in the next revision of the Guide:
 - Reduce the number of DGA marked as “Investigate” (i.e. in Status 2 or Status 3) without losing the capability to detect abnormal situations.

- Obtain a better correlation between DGA results and actual fault detection and identification.
- Adapt DGA interpretation to specific applications, such as windfarm, network, GSU, distribution.
- Build an industry wide database of DGA, including all pertinent transformer information, to support the future evolution of the guide.
- Adapt application of DGA interpretation to the use of on-line DGA monitors, specifically regarding the rate of change calculations.

Claude made a motion to create a Study Group to evaluate the way forward after the publication of C57.104-2019 "Guide for the interpretation of gases generated in mineral oil transformer." He suggested a scope that includes:

- Review the list of proposed revision topics in annex A of the guide.
- Propose any other topics that could be of interest.
- Evaluate each topic pertinence.
- Evaluate the best manner to address each topic in the next revision, or separately.
- Propose a working plan to address the documented topics. Some items may be best suited for independent work between now and the next PAR or would be documented for the next Working Group consideration.

Claude suggested the next step would be to define the duration, format and requirements needed to address these items. Mickel Saad seconded the motion. During discuss, a question was raised on whether IEEE would house DGA data into a common database. Other comments were to limit the work so as not to revise the entire C57.104 document, but to just focus on the short comings that should be identified and addressed (Claude confirmed that starting a revision of the C57.104 was not the intention of the proposal). The motion was unanimously approved and Claude agreed to serve as the Chair.

- b. Jinesh Malde brought to the attention of the subcommittee about the IEEE DEIS Technical Committee on Liquid Dielectrics.
- c. As a follow-up to the motion to renew the C57.146 PAR, Deanna Woods volunteered to serve as Chair. In addition, Jon Karas volunteered to serve as Vice Chair and Toby Johnson volunteered to serve as Secretary.
- d. David Wallach, Chair, announced that he will be stepping down as Chair of the Insulating Fluids Subcommittee at the end of the year as he will be moving into the main committee officer rotation beginning in January. Scott Reed will be stepping up as the new Chair of the Insulating Fluids Subcommittee at that time. Alan Sbravati volunteered to serve as Secretary.

G.5 Next SCIF Meeting:

March 25, 2020—Charlotte, NC

G.6 Adjournment

The subcommittee adjourned at 4:00 p.m.

Respectively Submitted, Scott Reed, Secretary IFSC

Unapproved Minutes from the S19 SCIF WG and TF meetings

Appendix II

Working Group for Acceptance and Maintenance of Insulating Liquids PC57.166

Tuesday, October 29, 2019

1:45 – 3:00 PM

Columbus, OH USA

Union CDE Room

Minutes of WG Meeting

Chairman Tom Prevost
Vice Chair Scott Reed
Secretary Alan Sbravati

The meeting was called to order at 1:52 pm by Chair Tom Prevost.

There were 29 of 37 members present. There were 54 guests. A membership quorum was achieved.

Introductions

Approval of Agenda

Approval of Spring 2019 Minutes

Call for Patents

New Document:

Title

Scope

Purpose

Review of Document Structure and Task Forces

Task Force Reports

TF1 Types of Insulating Liquids—Jinesh Malde

TF2 In Service—Scott Reed

TF3 Mixture of Insulating Liquids—Alan Sbravati

TF4 Maintenance of Insulating Liquids—Andy Holden

TF5 Insulating Liquids for LTCs—Rainer Frotscher

TF6 Editorial—Toby Johnson

New Insulating Fluids – Continued Discussion from Fall 2018 Meeting

Voltage Levels within Acceptance Tables- Discussion

New Business

Adjourn

The Spring 2019 minutes were unanimously approved. Motion for approving the minutes of meeting from Dominique Bolliger, second Mike Bonn.

The Spring 2019 agenda was unanimously approved. Motion for approval the agenda from Diego Robalino, seconded by Claude Beauchemin. No comments were presented, agenda approved unanimously.

Chairman Prevost posted the Patent Claim. No claims were made.

Chairman Prevost presented the copyright policy slides.

Chair's Remarks:

Chairman Prevost presented the scope and purpose of the guide, previously discussed. Next, the chair asked each task force to speak about their respective sections.

Peter Balma questioned whether the discussion about the additives is part of the standard. Topic belongs to TF 4.

TF1-Types of Insulating Liquids, Jinesh Malde

Jinesh presented the current version of the draft, which will be made available in the website. The proposed text already includes all previously planned sections. Rainer Frostcher proposed combining all limits of properties in a single table, but Jinesh replied the table would be too large, as the limits are different according to the voltage class. Peter Balma made an observation of making a clear differentiation between normative and informative references due to the difficulties and associated costs for getting all normative references. Claude Beauchemin second Peter's comment.

Jinesh presented the definitions for unused / used and for liquids in new equipment, for discussion.

Kevin Rapp made a comment that the definitions in ASTM are going to be discussed during their next meeting.

Jim Graham suggested moving the definitions to the C57.12.80 and Kurt Kaineder made a comment recognizing the value of the proposed definitions.

Sue McNelly questioned the number of categories, which was clarified by Tom Prevost.

TF2- In Service, Scott Reed

Scott presented the revised tables for the limits of the properties in use. He informed the test according to ASTM D877 was removed from the tables.

Scott explained the tables for synthetic ester liquids was developed based on the existing values for natural ester liquids, from C57.147.

For silicone liquid the information is only available for transformers up to 69kV, in a single column.

For LFH the tables include a category for applications up to 34.5kV and up to 69kV. David Sundin stated there are applications for LFH above 69kV and agreed to provided Scott data.

Michel from ABB made a question regarding the variation of the moisture content with temperature.

TF3-Mixture of Insulating Liquids, Alan Sbravati

Alan presented the first draft of the document developed by the TF, which includes an informative Annex for retrofilling transformers.

TF4- Maintenance of Insulating Liquids, Jon Karas presented on behalf of Andy Holden

The draft is still under development, including discussion around the processing of the liquids, reconditioning and reclaiming.

T5- Insulating Liquids for LTC's, Rainer Frotscher

Rainer presented proposed draft, based on C57.106. Some discussions were raised regarding the voltage classes, as Rainer proposed changing from 69kV to 72.5kV

Old Business:

Chairman Prevost mentioned there are no old business.

New Business:

No new business.

The meeting was adjourned at 3:02 pm.

Alan Sbravati, Secretary

Scott Reed, Vice Chair