UNAPPROVED MINUTES
SC Insulating Fluids Meeting
October 28, 2009
Lombard, Illinois

7.3. Insulating Fluids Subcommittee (Susanne J. McNelly, Chair, Jerry Murphy Vice-Chair, C. Patrick McShane, Secretary)

7.3.1. Introduction/Attendance

The Insulating Fluids Subcommittee meeting in Lombard, IL was called to order by the Chair at 3 PM on Wednesday, October 28, 2009. All of the officers of the SC were present. There were of 21 of 33 members present (quorum was achieved) and 45 guests present. The following guests requested membership:

Claude Beauchemin	Timothy Daniels
Rick Dong	Martin Navarro
Oleg Roizman	David Sundin

Claude Beauchemin, Oleg Roizman, and David Sundin will be added as subcommittee members. The remainder will be considered after the Spring 2010 meeting based on continued attendance and participation in the SC.

7.3.2. Introduction/Attendance, S09 Minutes Approval, & Patent Disclosure Request

As required the IEEE patent disclosure requirements were discussed and a request was made for disclosure of any patents that may be related to the work of the subcommittee. No new disclosures were forthcoming.

The Minutes of the Spring 2010 Miami, Florida meeting were approved as written.

7.3.3. WG & TF Reports Presented at the SC Meeting

7.3.3.1. <u>C57.104 – IEEE Guide for the Interpretation of Gases Generated in Oil – Immersed Transformers</u>.

WG Chair: Rick Ladroga,
WG Secretary: Sue McNelly
Tuesday, October 27, 2009, Lombard, Illinois

Report Given at the Sub-Committee Meeting:

Status of C57.104: The Guide has been published and is now available. Rick expressed thanks to those who worked to get the new Guide in place after it had previously been withdrawn.

A PAR for the Scope and Purpose was determined at the Spring 2009 meeting was submitted October 26th. Task force status reports were given and are detailed in the meeting minutes below.

Minutes (unapproved) of WG Meeting as Submitted:

The meeting was called to order by Chair Rick Ladroga at 1:45 pm. Secretary Susan McNelly was also present. There were 28 of 60 members present, 47 guests, and 12 guests requesting membership. The membership list was pared down based on attendance of a minimum of 2 of the

past 4 meetings. Since it is important to have the ability to achieve a quorum during WG meetings, new working group members will only be added when they indicate a willingness to participate and contribute to the WG effort. Attendance at meetings alone is not sufficient for membership consideration. Members presently on the list that do not in the course of development of the Guide participate and contribute, will be removed prior to the final draft being sent for ballot.

Guests requesting membership were:

Vivek Bhatt, Tim Daniels Rick, Dong Joe Foldi, Jefferson Foley, Jesse Inkpen*, Mark McNally Kent Miller, Jow Ortiz, Verena Pellon ,Charles Sweetser, Ajith Varghese

All of these guests requesting membership have been added to the WG roster as members. However, membership in the WG requires both participation and attendance unless other arrangements for corresponding membership have been made. Existing members of the WG may be removed due to non participation at any time.

Agenda

1. Welcome
2. Introduction
3. Approval of Minutes from Spring 2009 Porto, Portugal Meeting
4. Patent Disclosure
5. C57.104 – NEW GUIDE
    a. PAR submittal (Scope and Purpose)
    b. Task Force Reports:
        - DGA in Arc Furnace Transformers - Tom Lundquist
        - Framework Structure - Jim Dukarm
        - Data - Norman Field
        - Case Studies (Q – Existing – SDM, ABB, DOBLE, WEIDMANN, etc) - Brian Sparling
        - Diagnostic Studies – open
6. New Business

Approval of minutes from the Spring 2009 meeting in Miami, Florida was requested. The minutes were approved as written.

The IEEE Patent disclosure requirements were discussed and a request was made for disclosure of any patents that may be related to the work of the WG. There were no responses to the request for disclosure.

Status of C57.104: The Guide has been published and is now available. Rick expressed thanks to those who worked to get the new Guide in place after it had previously been withdrawn.

Rick Ladroga reviewed the membership requirements for the WG which have been identified above. He indicated that we need to make sure that those that are listed as members are working on the Guide and contributing. He welcomes those that wish to become WG members, but indicated that WG members will be expected to participate and contribute to the new Guide.

Rick announced that a PAR for the Scope and Purpose determined at the Spring 2009 meeting was submitted October 26th.

New Guide:

Task Force reports:

DGA in Arc Furnace Transformers – TF Chair Tom Lundquist

Tom Lundquist presented a presentation on the percentile values of DGA in arc furnace transformers. An annex will be added to the C57.104 gas guide. Tom outlined the data that was requested, received, and processed. The data was separated by fluid type (i.e. RTemp, mineral oil, Silicone, and a small insignificant number with NE).

Tom addressed the size effect, indicating that the data was broken down into 20MVA and larger and 19MVA and smaller categories. The only significant difference was that the smaller units had 17ppm higher Hydrogen.

Tom indicated that the 90^{th} percentile numbers from the data collected are what is proposed to be included in the annex.

Claude Beauchemin requested that those with nitrogen blanket be separated out in the data. Tom indicated that almost all of the transformers in the data set were nitrogen blanket type units.

Tom Prevost indicated that one of the things we should look at is that the numbers are not that far out of what would be seen for the general transformer population. He indicated that it may not be necessary to separate the arc furnace units out from other transformers. The only item somewhat different is the acetylene value, which could be handled with a note.

Framework – TF Chair Jim Dukarm

Jim discussed where we have been and that for the past year we have expended most of our effort into getting a document out for use as an interim Guide. Jim indicated that the idea of not having a Table 1 has been pretty well put to rest. He indicated that we are going to have to have something for values provided in the new Guide, perhaps as ranges of values, rather than absolute limits.

Jim indicated that he would like to have a document that is well organized and useful to new engineers just starting out.

Transformer Size discussion – Tom Prevost

Tom Prevost has done some research and has seen some difference in CO and CO2 values between large and small transformers. He reviewed greater than 100,000 data points and will provide the paper supporting his work for posting on the web site.

He broke the data into 25kVA, 1000kVA, and 20,000kVA categories based on oil/paper ratios. Tom indicated that he would send the data to Jim Dukarm and have him run some statistical analysis of the data. Tom expects that with the huge data set, that once the outliers are removed, there won't be a significant difference. Tom indicated that the IEC guide gives a range of values for each gas rather than a set limit. Tom indicated that the CO and CO2 values were higher for the smaller units.

Tom indicated that the challenge will be that the equipment information will be incomplete on the data submitted. He stressed that it is important for the data used to be as complete as possible.

Tom indicated that the most samples that he had from any specific unit was 5.

Tom indicated that CIGRE in the course of doing a project collects literature for inclusion in a bibliography. He indicated that we should start working on building a bibliography for the document. Rick asked if there was anyone willing to head up a new TF on putting together a bibliography. There were no takers.

A request was made that the names and contact information for the TF chairs be provided for people who wish to participate on one of the TFs.

Schedule:

1. Rick indicated that we need to kick start the new Guide to get things rolling. He suggested that initially bi-weekly meetings be held on Wednesdays. He would like to have input from Diagnostic Methods and data case studies by December 16th.

2. Issue compiled draft for WG TF review by Jan 13,' 2010.

3. Continue meeting bi-weekly editing and refining in preparation for the Spring 2010 IEEE Transformers Committee Meeting in March.

4. Incorporate comments from the WG TF review and revisions by February 24, 2010.

5. Issue draft to entire C57.104 WG for review and discussion at the Spring 2010 meeting.

Task Forces:

Rick went through the TFs that are in place and the present chairs for each. He also indicated that anyone wishing to participate in the TFs should contact the Chairs of each.

1. Arc Furnace – Chair Tom Lundquist
2. Framework – Chair Jim Dukarm
3. Data – Chair Norman Field
4. Case Studies – Chair - Open
5. Diagnostic Methods – Chair - Open

The meeting was adjourned at 3:00 pm.

Rick Ladroga
WG Chair

Susan McNelly
WG Vice-Chair and Secretary

7.3.3.2. IEEE C57.121 Guide for the Acceptance and Maintenance of Less Flammable Hydrocarbon Fluids in Transformers. WG Chair: David Sundin

Report Given at the Sub-Committee Meeting:

The WG Chair advised that the reaffirmation vote results are pending. Nothing further to report.

7.3.3.3. IEEE C57.130 IEEE Trial-Use Guide for Dissolved Gas Analysis During Factory Temperature Rise Tests for the Evaluation of Oil-Immersed Transformers and Reactors. WG Chair: Fredi Jacob WG Secretary: Sue McNelly

Report Given at the Sub-Committee Meeting:

The WG has been inactive. The issue has been discussed by report was presented by Tom Prevost. He started with a background summary stating that the PAR was started in 2000. Draft 17 went to ballot on July 2006. 116 ballots produced 60 comments. So far the WG has been unsuccessful collecting additional data nor is there data to substantiate the values in Table 1. Tom does not believe

any further extensions will be granted due to the four years of inactivity. He suggested to let the PAR to expire, and submit a new PAR. A new effort to get data is needed. Many negatives related to different size transformers need to be addressed. A motion was made by Tom Prevost to have a new PAR submittal. Rick Ladroga seconded, and the motion was carried. Jim Thompson agreed to chair the new PAR submittal draft TF. Jin Sim staed that the data collecting must be done very carefully due to the low expected values, which makes it difficult to get similar test results between different labs. It was mentioned that Draft 17 was based on gas increase, not absolute gas values. Tom made a plea to transformer manufacturers to provide their heat run DGA data.

Minutes (unapproved) of WG Meeting as Submitted:

No WG meeting was held.

7.3.3.4. IEEE C57.139 IEEE Dissolved Gas Analysis in Load Tap Changers. WG Chair: Fredi Jacob WG Secretary: Sue McNelly

Minutes (unapproved) of WG Meeting as Submitted:

Sue McNelly, WG Secretary, presented. Draft 12 would be going to ballot within a few weeks. The PAR is set to expire at the end of the year. A request for a 12 month extension was submitted. A PAR for continual refinement is in the planning stage. A question was asked if the requested extension of 12 months would be sufficient. Tom Prevost stated that the WG should not count on getting a longer extension as the one was granted previously.

7.3.3.5. WG PC57.637 Guide for the Reclamation of Insulating Oil and Criteria for Its Use Chair: Jim Thomson; Co-Chair: TV Oommen

Report given at the Sub-Committee Meeting:

Jim Thompson stated that the PAR was approved in December 2008. There were no further comments or discussions.

Minutes (unapproved) of the WG meeting as submitted:

Unapproved Minutes Working Group Meeting PC57.637 October 27, 2009: The working group meeting was conducted at 8 am on October 27, 2009 with 22 people in attendance with 17 of the 19 working group members present. This document was reaffirmed in 2007 and the PAR for revision has been approved December 10, 2008. Working Group members Jim Thompson (chair) and TV Oommen (co chair) conducted the meeting. There was a request for patent declarations regarding the PC57.637 document and none given. The minutes were approved with no negatives. The discussion of the meeting included a) a name change of the guide include “mineral;” b) references to 40CFR761 for askeral trade names; c) reference to local guidelines for PCB handling and disposal requirements; d) leaving out the definition of natural esters from the draft language; e) including language to address high molecular hydrocarbons; d) posting the moisture tutorial from 2004 on the IEEE Transformer Committed website under the Insulating Fluids Subcommittee web site; and e) changing the draft to conform to the IEEE style guide. Assignments were made prior to the meeting for all sections except section 6.9 regarding choice of reclamation methods.

Respectfully submitted,

Chair Jim Allen Thompson

Co Chair TV Oommen

7.3.3.6. TF Natural Based Ester Fluids DGA Guide Development

Chair: Paul Boman, Secretary: John Luksich, 9:30 am Tuesday, October 27, 2009 4th meeting of the group.

Report given at the Sub-Committee Meeting:

Paul Boman made the presentation. The TF will apply a PAR to become a WG. Sue McNelly advised that the PAR draft was approved and forwarded to the Chair of the Standard Subcommittee, Bill Bartley.

Minutes (unapproved) of the TF meeting as submitted:

Attendance:
Attendance total attendees 53, Members 14 attendees were guests with 6 attendee requested membership
Patents:
No patents were disclosed.
Miami Minutes from Spring 2009:
Motion to approve the meeting minutes from Miami made and the Task Force approved the minutes
Discussion:
The PAR Application Process will be start with development of Guide Scope and Purpose
Task Force edited Scope and Purpose resulting in the following statements:

Scope:
This guide application is for Natural and Synthetic Ester-immersed transformers. This guide addresses the following:

- The theory of combustible gas generation in a natural and synthetic ester filled transformer
- Interpretation of the dissolved gas analysis results
- Recommended actions based on the interpretation of dissolved gas analysis results.
- A bibliography of related literature.

Purpose:
The purpose of this guide is to assist the transformer operator in evaluating Dissolved Gas Analysis (DGA) data obtained from natural ester and synthetic ester filled transformers.
Lines were removed in Scope about sampling and sample analysis at laboratory. Also removed statement that limited the guide application to transformers originally designed for these fluids.
Format for DGA Guide was discussed with a template taken from the silicon Fluid DGA guide. The IEEE style guide will be used during the initial drafting process.
Inclusion of the Oswalt Coefficients in the guide was discussed with the decision to place a table in the Annex.

Volunteers for Task Force Sections:
David Sundin – synthetic ester theory section
Dave Hanson- natural ester theory section
Laboratory data interpretation and formatting
Dave Hanson, Jesse Inkpen, Tad Daniels, Dr. James Dukarm, John Luksich, Paul Boman

Examples & Case Studies- not filled

Bibliography & Annex
Mark McNally

Chair is planning to use Webnar to speed up development time-line
Viewed several slides with available laboratory data

Adjournment

Motion to adjourn meeting which was made and seconded by Task Force Members.

7.3.3.7. TF Guide for Field Application of Natural Esters

Jim Graham – Chair, Jerry Murphy Vice-Chair

Sub-Report Given at the Sub-Committee Meeting:

Jim Graham presented the TF task force meeting summary. The meeting was one short of quorum. After the request by the Chair for patent disclosure,

TF meeting minutes (unapproved) as received:

Meeting Date: 10/27/2009 Time: 3:15 – 4:30 PM

Current Draft Being Worked On: Draft 1, March 2008

Attendance: 12 members, 31 guest (2 requesting membership)

The meeting was called to order at 3:15 PM. Introductions were skipped, and an attendance roster was circulated. Membership attendance was checked, and we did not have a quorum. The chair asked if there were any patent disclosures, which triggered a discussion of the purpose of the disclaimer and how to interpret the disclaimer requirements. No patent disclosures were made. The Spring 2009 task force minutes were sent out prior to the meeting for comments, and no corrections were submitted.

The chair discussed presented a draft of the PAR application based on previously approved task force recommendation of scope and purpose. With no quorum the group was unable to approve the final scope and purpose during the meeting. The chair will contact the members via e-mail to get final consensus on the title, scope and purpose for the PAR. The following subjects were discussed:

Does this task force belong in the Insulating Fluids Subcommittee? Consensus is yes.

Many of the proposed sections of this guide would duplicate material duplicate sections 6, 7 and 8 of sections IEEE C57.147-2008 IEEE Guide for Acceptance and Maintenance of Natural Ester Fluids in Transformers. Should IEEE C57.147 be revised, or left as is if this guide is finished? No strong support one way or the other was given by those present. A proposal will be sent to the group for comments.

Should synthetic ester fluids be included? No; the task force has previously discussed this issue and decided to limit the scope to natural esters only. No new data was presented to change this decision.

Should the title of the guide be changed to remove **Field** from the title of this Guide? Task force members will be polled and comments solicited.

The chair asked how many of the attendees were asked if there was still interest in creating the guide. There was a near unanimous affirmative response. When the attendees were asked if they were willing to volunteer to work on the proposed guide, few indicated a willingness to join the task force.

Dave Harris resigned as secretary and Patrick McShane agreed to fill the position.

The meeting adjourned at 4:30 PM.

7.3.3.8. TF on Particle Count Limits - Chair: Mark Scarborough

Report given at the Sub-Committee Meeting:

No report was given. A TF member did announce that the Chair was setting up a webcast meeting in November for the TF.

Sub-Report Given at the Sub-Committee Meeting:

No TF meeting was held at F09 meeting.

7.3.3.9. TF on Moisture in Insulation - Chair: Bob Rasor

Report given at the Sub-Committee Meeting:

The Chair stated that the main intent of the TF is to gather and review currently available data. There was high attendance at the TF meeting showing the interest is high. Jim Thompson suggested that the TF wait for the publication of the next revision of the Insulation Live Sub-Committee document titled "Determination of Moisture in Transformer Insulation that used up-to-date data from global sources. A motion was made to for the TF to wait, seconded by Don Platts. After discussion, the motion failed. Discussion: Sue McNelly asked if any new information/data received since the latest issuance of C57.106. Tom Prevost stated that there is work being done globally, so the goal for data collection should be done. Jim Thompson replied that collecting data without a clear end goal of the TF is questionable value. Jin Sim stated, while he had no issue with collecting data, that the issue is complex for converting ppm to percent saturation as there are several variables including oil contamination. He suggested not pushing for a change until the Insulation Life document is published.

TF meeting minutes (unapproved) as received:

The meeting was called to order by Chair Bob Rasor and vice chair Hali Moleski at 3:18 pm. The roster indicated there were 88 attendees present. Of those present, 23 requested membership. Attendees requesting membership were:

Tony Pink	C.J. Kalra	Paul Boman
Eduardo	Subhas Sarkar	Dinesh
Garcia	Frank	Chhajer
Flavio Neuls	Trautmann	Jon Kopf
Mark Rivers	Dave Hanson	Jin Sim
Dennis Allan	Oleg Roizman	Jeffrey Britton
Tom Prevost	Claude	Don Cherry
Jorge	Beauchemin	Ron Nicholas
Gonzalez de la	Juan	
Vega	Castellanos	
Don Platts	Jim Thompson	

Agenda

1. Welcome and roster
2. Introduction of Chair and vice Chair
3. Brief explanation for beginning the task force
4. Discussion of preliminary scope
5. Discussion and comments from attendees
6. Meeting was adjourned 4:08 pm

An introduction to this new task force was given by Chair Bob Rasor. The main focus of the task force is to improve the understanding of the meaning of moisture levels in oil. The emphasis of the TF will be to gather data and understanding. The purpose is not to create or modify existing standards – rather to gather data.

The objective of the meeting was to:

- Give attendees an opportunity to provide general comments
- Define and clarify the scope

Once opened up for discussion, many topics were discussed that included the following:

- possibility of overlap with other existing standards
- issues with previous version of C57.106 and its affect on the industry
- changing the TF name to Moisture in Transformers
- consideration of including other parameters such as particulates, dielectric strength, dissolved gas and furans with moisture and how they relate to each other
- caution in allowing the large group to determine the scope, as much more can be accomplished in smaller groups with a better defined scope

It was commented that moisture data collection would benefit the industry as it is a very interesting topic with many interested individuals as evident by the number of people attending the meeting. And if the data eventually would affect current guides, it would be carefully handled at that time. Chair Bob Rasor commented that data collection was the main focus of the TF.

7.3.4. Old Business:

None

7.3.5. New Business:

Rowland James recommended the use of proxy to help the SC, WG, and TF meetings quorums.

Respectfully Submitted:

Susan McNelly, Fluids SC Chair
Jerry Murphy, Fluids SC Vice-Chair
Patrick McShane, Fluids SC Secretary