The Minutes (unapproved) of TF Meeting as Submitted:

TF Next Revision to C57.104: Guide for Interpretation of Gases Generated in Mineral Oil-Immersed Transformers

Monday, November 15th, 2021 3:45 PM (central time)

The virtual meeting was called to order by Chair Claude Beauchemin at 3:45 PM central time. Claude introduced himself, Norman Field (Vice Chair) and Hali Moleski (Secretary). There were 110 attendees at the start of the meeting. There are 59 members, with 23 attendees that requested membership last meeting (Spring 2021). Quorum was made with 31 of the 59 members according to the poll. Of those 23 that had requested membership, 13 were in attendance in this meeting (italicized below). These 72 members are listed below. There were 6 attendees that requested membership this meeting. If all membership requests were accepted, the new membership count would be 78 members.

Members (59 original and 13 new based on F21 meeting attendance):

1. Anand Zanwar
2. Anastasia O'Malley
3. Bill Whitehead
4. Bob Rasor
5. Brad Staley
6. Brady Nesvold
7. Cihangir Sen John
8. Claude Beauchemin (Chair)
9. David Calitz
10. David Murray
11. David Wallach
12. Diego Robalino
13. Dmitriy Klempner
14. Don Dorris
15. Donald Lamontagne
16. Dwight Parkinson
17. Emilio Morales-Cruz
18. Eric Doak
19. Erich Buchgeher
20. Florin Faur
21. Hali Moleski (Secretary)
22. James Dukarm
23. Jayme Nunes
24. Jerry Murphy
25. Jim Graham
26. John K John
27. John Pruente
28. John Sinclair
29. Jon Karas
30. Juan Acosta
31. Kris Zibert
32. Mani Kumar
33. Larry Christodoulou
34. Lee Doyle
35. Luiz Cheim
36. Marco Espindola
37. Markus Schiessl
38. Michael Botti
39. Mickel Saad
40. Monty Goulkhah
41. Nick Perjanik
42. Nitesh Patel
43. Norman Field (Vice Chair)
44. Oleg Roizman
45. Paul Boman
46. Roger Hayes
47. Samragni Dutta Roy
48. Scott Reed
49. Shiva Rampersad
50. Stacey Kessler
51. Stephanie Denzer
52. Stuart Chambers
53. Sukhdev Walia
54. Susan McNelly
55. Timothy Raymond
56. Ashmita Niroula
57. William Boettger
58. Zack Draper
59. Zan Kiparizoski

60. *Afshin Rezaei-Zare*
61. *Amitahh Sarkar*
62. *Anatoliy Mudryk*
63. *Anthony Franchitti*
64. *Balakrishnan Mani*
65. *Brian Sparling*
66. *George Frimpong*
67. *Ion Radu*
68. *James Gardner*
69. *Juan Castellanos*
70. *Mike Waldrop*
71. *Robert Harper*
72. *Stephan Brauer*

Attendees Requesting Membership

1. Edmundo Arevalo
2. Elise Arnold
3. Ismail Guner
4. Arturo Nunez
5. Josue Rodriguez
6. Risto Trifunoski

The agenda was reviewed along with patent call and copyright policy. None were opposed to the Spring 2021 meeting minutes emailed prior to the conference. Motion to approve was by Jon Karas and seconded by Jon Sinclair.

Next, a presentation was given by Donald Lamontagne on online monitoring analytical techniques specific to transformer dissolved gas analysis. Don shared that this was also presented in C57.143 annex. And that a patent claim was submitted. After the presentation, discussion followed.

Phil Hopkins – Has Don been able to associate certain gasses based on causal events (example was given as to solar transformers and certain increased gassing traced back to phenomena in the core)? Don replied he did not look at transformers hooked up to solar inverters. He would expect the type of gasses unique to these units, and there would need to be specific changes made to algorithm used in TOAN.

Luiz Cheim asked if Don could explain what was patented. Claude stated we could not discuss the detail of the patent. Don said that when the letter of agreement is posted, it will show what is patented.

Luiz asked how the algorithm handles the fact that CO and CO2 may not necessarily be from paper aging. Don shared that all their transformers are sealed.

Claude thanked Don for his presentation.

Claude reviewed the activities of the CIGRE WG D1/A2.77 “Liquid Tests for Electrical Equipment”. Proposal for a CIGRE/IEC centralised data repository of transformer related test and operating information. The slides were not all read, but Claude said they would be in the meeting minutes. See below in Italics.

It had been observed by various members of the WG that obtaining the data required to develop improved diagnostic techniques, such as for example DGA interpretation or insulating liquids quality assessment, is often one of the main difficulties of the WG task.

CIGRE WG are per their nature temporary (2 – 3 years) and group typically a few dozen of world experts tasked to address specific questions about topics of interest to the general community of energy production.

In most cases, addressing those specific questions require large amount of data to be available for review and discussion to produce improvements in methods of analysis or in procedures of operation. Obtaining this data has proven to be quite difficult, requiring a large amount of time and efforts, taking a valuable part of the time and resources available to the WG. Unfortunately, when the WG conclude its task and is disbanded, the accumulated data is lost, as there is no "universal" permanent repository available where the WG could transfer the data it accumulated for the benefit of the next WG that will address a similar topic in the future.

A good example is data for Dissolved Gases Analysis (DGA). There have been several WG working on the topic of DGA interpretation in the past few decades and several Technical Brochures have been issued on this topic (In the last 15 years: TB 296, TB 409, TB 443, TB 771 and TB 783). Each time the WG convenor had to request various WG members to supply "had hoc" data in order to generate the interpretation method updates or new limits tables. After each of those WG had completed their work, the accumulated data was not retained.

We therefore propose the constitution of a central repository to collect and conserve data accumulated by the various WG. This repository could either be hosted by the CIGRE, the IEC or be a joint operation.

We recognise that such endeavor will have to address several possible roadblocks to be successful, but we consider the required effort to be worthwhile. Some of the items that will need to be addressed for success are as follow:

Protection of data supplier's anonymity with its associated NDA and other legal considerations (including "opting out" option from specific future WG).

Data security.

Universal transformer "Basic data set" containing the information of use for various tasks (e.g. Type, size, rating, insulating liquid, oil preservation system, loading….)

Uniformized data format (It will be different for each different type of data but need to be uniform withing a category, regardless of the data supplier).

Long term data storage and maintenance.

Control of data access to prevent missuses.

Clear usage protocols and user's obligations, including users NDA.

Some of the work already performed by various WG, specifically or partially, on data handling and integration (for example, TB 298, TB 630, TB 706 and TB 761) probably contain information useful in addressing some of the items mentioned above.

Claude mentioned some publications of interest that are relevant to our TF.

"The Data Behind the Numbers: IEEE C57.104TM-2019 DGA Interpretation Guide" By C. Beauchemin, L. Cheim and N. Field. Transformer Technology Magazine, January 2022.

"Near-Term Failure of Transformers Using Reliability Statistics on Dissolved Gas Analysis". by Z.H. Draper and J. J. Dukarm. In 2021 CIGRE Canada Conference, number 408, Toronto ON, October 2021.

Then a list of IEEE Working Group and Task Forces were given that were relevant to our task force.

Monday 10H50: WG Guide for DGA in Silicone PC57.146, J Karas
Monday 14H20: WG Transformer Monitoring C57.143, M. Spurlock
Tuesday 10H50: TF Guide DGA for Factory Temp Rise Tests - C57.130, J. Foschia
Tuesday 14H20: WG Guide DGA in Ester-Immersed Transformers PC57.155, A. Sbravati
Tuesday 15H45: TF Revision of Guide for DGA in LTCs C57.139, R. Frotscher

Claude asked if there was any new business.

Mickel Saad asked if data was gathered on industrial transformers. Claude said that the data used in C57.104 does have a decent number of small transformers. It was also noted that some types such as windfarm transformers behave differently, and cautionary statements are given accordingly. Though that is one area of improvement that is not done yet. Another improvement to 104 would be to cover online DGA data.

Luiz Cheim noted that CIGRE had a proposal in consideration for a Working Group on online monitoring as well. It is not approved yet but may know in 6 months or so if approved.

No new business was brought forward. Meeting was adjourned unanimously a few minutes past five o'clock central time.