

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

Meeting Minutes

October 24, 2016

Vancouver BC

Tom Prevost - Chair

Valery Davydov- Vice Chair

Deanna Woods – Secretary

Stephanie Denzer – Secretary for this meeting

Attendance: Members: 39 of 88
 Guests: 49 guests with 8 requesting membership

The following guests requested membership

| | |
|-----------------|-----------------|
| Roger Hayes | Marcos Ferreira |
| Shane Goydich | Kiran Vedante |
| Sheldon Kennedy | Kevin Sullivan |
| Jeffrey Ray | |

The meeting was called to order at 11:00 am. Introductions of the Vice Chair and (temporary) Secretary were made.

Members of the working group present at the meeting were asked to stand and be counted to assess whether there was a quorum. We had 39 of 88 members present so we did not have a quorum. The chair noted that since we did not have a quorum, we could not do any official business.

The agenda of the meeting was presented for comment. No additional agenda items were suggested.

Meeting Agenda:

- Introduction of attendees
- Establishment of Quorum
- Approval of Agenda
- Approval of Minutes from March, 2016
- Call for Patent Claims
- Review of PAR
 - Project Scope
 - Project Purpose
 - Project Timeline
- Chair's Remarks
- Presentation, "Case Study: Investigation into High Risk Associated with Wet Oil Resulted in Transformer Failure", Valery Davydov
- Update on Task Force Activity

The following call for patents was shown to the members and guests. No one responded.

If any individual believes that Patent Claims might be Essential Patent Claims, that fact should be made known to the entire working group and duly recorded in the minutes of the working group meeting.

The scope and purpose of the project were reviewed by the chair.

A request for volunteers to edit the document once the TF reports have provided their drafts was made. If anyone is interested, please contact Tom Prevost.

Valery Davydov gave a presentation “**Case Study: Investigation into Transformer Failure and Positioning of On-Line Moisture Probes**” for Task force 6. A question was presented by Roger Fenton and a response for follow up offline was given.

Task Force Reports

Task Force 1 – Terminology and Definitions

Task Force Leader (Jeff Golarz)

Tom Prevost presented as Jeff was not present. Jeff has compiled all of the terminology and definitions that have been submitted by the task forces. This is ready to be included in the main document.

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

Task Force Leader – Tom Melle

Progress is being made, a presentation summary is available on the transformer committee website. The first draft of the chapter was requested to be completed by the end of January 2017.

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

Task Force Leader – Claude Beauchemin

Cigre is currently working on this effort and should be completed 1Q or 2Q 2017, hoping to utilize this information. A draft was requested by end of January 2017.

Task Force 4 – Measurement of moisture in solid insulation.

Task Force Leader – Ron Hernandez

The task force has completed its work and the chapter has been submitted to the WG chair for inclusion in the document. The chair complimented the members of the task force for completing their assignment.

Task Force 5 – Estimation of moisture in solid insulation using dielectric response methods

Task Force Leader George Frimpong

The task force has completed its work and the chapter has been submitted to the WG chair for inclusion in the document. The chair complimented the members of the task force for completing their assignment.

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

Task Force Leader – Valery Davydov

A presentation was given on the position of moisture sensors. It was suggested that the TF considers including into a draft a discussion on the issue of positioning of moisture sensors in the main oil circulation and away from it. A draft of this section should be ready by the end of January 2017.

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

Task Force leader – Roger Wicks

No update – draft to be completed by the end of January 2017.

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

Task Force leader – Poorvi Patel

The task force has completed its work and the chapter has been submitted to the WG chair for inclusion in the document. The chair complimented the members of the task force for completing their assignment.

Task Force 9 – Field application of knowledge on moisture * Note: *This section lists the risks associated with moisture*

Task Force leader – Jim Thompson

The chair presented TF chair Thompson’s summary of progress to date.

“I am reviewing papers and guides on moisture risks including bubble evolution in oil, dielectric failure, and premature aging of paper. I authored the Cold Start VDE response curve in the C57.106-2015 Annex and can provide more details. Other guides already have bubble evolution risk information. I will search the IEEE Explore site for aging vs moisture in paper/oil systems. I hope to have a draft in two weeks. I still don’t have e current C57.91 but will get a new C57 series CD after this meeting. Most of the text regarding risks will be discussion and references to C57 guides. I will also add a bibliography.”

It was suggested that this document must include moisture levels associated with known risks. The chair commented that this should be included in the work of TF 9.

Rough Draft of section to be completed by end of January 2017.

Task Force 10 – Task Force 10 Moisture Migration, Distribution and Moisture Equilibrium Charts

Task Force leader – Bruce Forsyth

The task force received additional volunteers since last meeting and a scope has been developed.

TF 10 Scope:

This chapter presents the best known information related to

- a) Moisture migration in insulation systems;
- b) How moisture distributes throughout an insulation system;
- c) Moisture equilibrium charts applicable to transformer insulation systems.

The initial focus will be on liquid-filled insulation systems, but an effort will be made to provide similar information for gas-filled insulation systems.

Oleg Roizman commented that basic adsorption isotherm curves for cellulose were developed in 1960 and came from the textile industry. He asked a question on whether or not to use these existing

“Jeffries” curves or create new ones. The chair commented that the development of new adsorption curves, although preferred, may take too long for inclusion in this document. (Task force is looking for input from material suppliers)

A draft as was asked to be completed by the end of Jan 2017.

This meeting was adjourned at 12:15pm