

H.3.2.7 Task Force on C57.100: Test Procedure for Thermal Evaluation of Insulation Systems for Liquid-Immersed Distribution and Power – Roger Wicks

The Chair called the meeting to order at 9:15 AM and welcomed attendees to this first meeting of the task force. The Chair noted members of the previous Working Group on C57.100 have been added as guests on the rosters. Since this is the first meeting, there was no quorum and all of the discussions related to the document are only to gain consensus of the attendees of the meeting. The Chair also provided information related to the Patent disclosures, even though such disclosures are not needed until the working group is formed.

The Chair reviewed the proposed meeting agenda, which was focused on developing a title, scope and purpose for the PAR to revise C57.100. As we are only a task force, no approval of the agenda was necessary.

There were 69 total attendees at the meeting, of whom 17 requested membership, bringing the total number of members (once the working group is formed) to 18 (including the task force chair).

H.3.2.7.1 Title Review

The current title was presented for review along with a version with a minor modification to be: **IEEE Standard Test Procedure for the Thermal Evaluation of Insulation Systems for Liquid-Immersed Distribution, Power and Regulating Transformers** and the Chair invited comments related to recommended changes. A question was raised regarding why the documents does not cover all liquid-immersed equipment. The Chair noted this would be a part of future discussion.

After some discussion, the Chair polled the group and the consensus was to use the modified title.

H.3.2.7.2 Scope Review

The Chair presented the current scope with updates to reflect the modified title.

The Chair briefly overviewed key sections of the current document specifically related to Power and Distribution transformers. Sasha Levin and Jin Sim provided input related to the similarity of insulation systems between regulating transformers and the power and distribution transformers. In specific, Sasha suggested we could survey producers of such equipment and verify if the ratio of materials were consistent with the other applications, and if so, that the tests could be used as written. Here is the revised scope based on the revised title:

This standard applies to the insulation systems used in all liquid-immersed distribution, power and regulating transformers. This standard provides test procedures to evaluate the thermal aging characteristics of insulation systems used in liquid-immersed distribution, power or regulating transformers. The dielectric liquid is part of the insulation system.

There was consensus that the scope as written was acceptable.

H.3.2.7.3 Purpose Review

The Chair presented the current purpose and opened the floor to comments. A question was asked whether anyone uses the document for item a) which is to provide a basis for the selection of a limiting hottest-spot temperature for rating purposes.

There was a lengthy discussion regarding whether the purpose is to establish solid insulation or oil temperature limits. Certain challenges related to establishing oil temperature limits were identified and one member suggested oil temperature limits should be established by other groups. Various wording proposals were discussed.

After a lengthy discussion, the Chair polled the group for preferences of the various versions that had been discussed to replace the existing item a), as well as to modify item b) with the disclaimer that the life curves derived from the C57.100 test procedure are theoretical. The version with most support is as follows:

The objective of this test procedure is to establish uniform methods for investigating the effects of operating temperature on the life expectancy of liquid-immersed transformer insulation systems. The results of these test procedures are expected to

- a) Provide the basis for the selection of material temperature limits for rating purposes
- b) Provide theoretical life curves that may serve as the basis for a guide for loading
- c) Permit the comparative evaluation of a proposed insulation system with reference to an industry proven system that has been shown to be acceptable in service

H.3.2.7.4 Proposed Revision Items

In the time remaining, the Chair presented several proposals for items that the future Working Group may want to consider for revision. Some of those items are as follows:

- Modify test methods to add regulating transformers if included in the scope of the revised document.
- Consider additional testing information regarding areas of omission from past document:
 - Enamel coated wire evaluation technique
 - Diamond dotted coated paper evaluation technique
 - Discussion on what testing would be required if have approval for one type of transformer (distribution or power) and need to qualify for other – full evaluation or some reduced testing requirement.
 - Better define the scope of minor changes requiring single point testing. Current document describes minor changes to industry proven system – also need method for minor changes to new systems.

Additional suggestion presented by attendees included:

- Look at the definition of industry proven system (does it need to be 180,000 hours or not)?
- Do we need to incorporate discussion on the pressure within the materials test methods (such as do we specify using pressure relief valves at what pressure)?
- It was also noted that there is a CIGRE working group studying aspects of insulation that may provide useful information to the revision of this document.

The meeting adjourned at 10:45 AM

Respectfully submitted,

Bruce Forsyth
Secretary