

WORKING GROUP ON THERMAL EVALUATION OF
POWER AND DISTRIBUTION TRANSFORMERS (C57.100)

October 24, 2005

Memphis, Tenn.

Roger Wicks, Chairman

1.0 Introduction and Rosters

The working group met on Monday, October 24, 2005 at 9:30 AM with 12 members and 36 guests attending. Five guests requested membership in the working group.

2.0 Approval of minutes from March 14, 2005 meeting

The minutes of the March 14, 2005 meeting in Jackson were approved as written.

3.0 Patent Disclosure

The chairman asked if anyone knew of any patents which could pertain to this project. There were none.

4.0 Discussion IEC – 62332 – Electrical Insulation Systems (EIS) Thermal
Evaluation of Combined Liquid and Solid Components

The chair noted that this document has now been published as a final document. The chair then solicited input from the working group related to how one could get approval from IEC to allow us to use this document for a starting point in discussion related to model testing. Don Platts agreed to help make this contact. Likely contact will be through Charlie Zegers at ANSI. Bill Simpson, who was a member of the working group also was volunteered as well.

Portions of the document were then shown to the working group, including showing a schematic of the aging cell, which allows for aging of materials with dissimilar thermal capability. (Such as high temperature fluids and cellulose, or high temperature solids and mineral oil). The aging philosophy was then discussed, whereby there are suggested times/temperatures established in the document, where there are specific criteria for evaluation of both the solids and the fluids, and whereby there is a method described for establishing the ratio of materials within the aging device.

Jin Sim asked if there was moisture content and/or oxygen content specified in the method (as they are in the other methods to some extent), and it was agreed as a group that this should be in our final method.

This led to a discussion regarding adoption of IEC by IEEE and whether portions could be adopted, after the discussion (Jin Sim, Hasse Nordman, and Patrick McShane), that partial adoption with appropriate reference has been done in the past.

5.0 Discussion of DuPont-Weidmann test of Model using Thermally Upgraded Kraft

The chair then described a test current just beginning by a joint team from DuPont and EHV Weidmann – using this model to evaluate different thermally upgraded papers, ranging in Nitrogen content from 0% (non-upgraded) to 3.4%. A single test was conducted in the last couple of weeks as DuPont was finishing installation of new oil processing equipment, which gave results similar to expected data. The plans are to age all four papers at three different temperatures to both validate the aging model, but more importantly to help the community address issues regarding how to evaluate thermally upgraded kraft (more than just the QC test for percent Nitrogen). Jin Sim noted that they feel this test is necessary to then buy into the Nitrogen content as a release test.

Jin noted that we need to specify oxygen and moisture content in these tests, and the chair will discuss and note in the test plan.

Jin Sim noted that there is a lot of confusion by users who only casually read the documents in reference to the number of hours listed. For example, if one uses 50% tensile retention, you get 65,000 hours, if one uses 200 DP, you get around 150,000 hours and if you use the C57.100 method (Lockie test), you get 180,000 hours. Jin suggested the criteria be more clearly stated.

6.0 Work Going Forward

The chairman asked for volunteers with experience with either of the two methods to look at the C57.100 document. Patrick McShane agreed to look at it. The chair will also circulate the document to working group members with this assignment.

Jin Sim asked if other IEC documents could be useful in this work, and Jane Verner agreed to search to see if she could find other work.

Jin noted that the requirements in C57.100 for short circuit testing and dielectric testing were very useful, but very difficult to do on a large scale. Hasse Nordman then described actual life of transformers with non-upgraded life with known hot spot temperatures not meeting expected life from aging curves in standards (non-upgraded kraft with only 90°C hot spot in a GSU application, for example). He feels that if there are lab tests which can provide “derating” based on factors it would be very useful.

7.0 Adjournment

The meeting adjourned at 10:35 AM.