

## **7.6 POWER TRANSFORMERS – TOM LUNDQUIST, CHAIRMAN**

The Power Transformers Subcommittee met on Wednesday, Wednesday, October 27<sup>th</sup> 2010 at 1:30 p.m. A quorum was present with 65 members and 120 guests.

The minutes from the spring 2010 meeting in Houston, Texas were approved with no changes.

The chairman asked if anyone was aware of any patent conflicts, none were voiced.

### **7.6.1 WORKING GROUP AND TASK FORCE REPORTS**

#### **7.6.1.1 TASK FORCE FOR REVISION OF C57.17, REQUIREMENTS FOR ARC FURNACE TRANSFORMERS – Domenico Corsi, Chairman**

Bob Ganser will take over as the Chair for this WG. Editorial changes recommended by IEEE will be made to the document and the Standard will be issued for balloting in the near future. This work needs to be completed by October 2011.

#### **7.6.1.2 WORKING GROUP FOR DEVELOPMENT OF PC57.143, GUIDE FOR APPLICATION OF MONITORING TO LIQUID IMMERSED TRANSFORMERS AND COMPONENTS – Donald Chu and Andre Lux, Co-Chairmen**

The document has been balloted and comment resolution is in process.

#### **7.6.1.3 WORKING GROUP FOR DEVELOPMENT OF PC57.148, STANDARD FOR CONTROL CABINETS FOR TRANSFORMERS – Joe Watson, Chairman**

The WG did not meet. The document is under revision in response to comments received during balloting. The revised draft should be re-balloted in early 2011.

#### **7.6.1.4 WORKING GROUP FOR DEVELOPMENT OF PC57.131, STANDARD REQUIREMENTS FOR TAP CHANGERS - William Henning, Chairman**

The Working Group on Tap Changer Performance met on Monday, October 25, 2010 at 1:45 pm with 9 members and 28 guests present. At the beginning of the meeting, just after introductions and a call for patents, a quorum check indicated no quorum. However, by the end of the meeting we did have a quorum with nine members.

The working group is in the middle of the comment resolution process on its ballot of Draft 1.5 of C57.131, *Requirements for Tap Changers*. The comment resolution committee reviewed the comments, via email, before the meeting. Of 130 comments, seven were identified as needing further discussion. Most of the meeting time was devoted to discussion of the seven topics.

Also discussed was the need to regenerate artwork for the Appendix. These figures consist mostly of phasor diagrams, circuit diagrams, and other simple line drawings. In the draft used for balloting purposes, the diagrams were cut from the PDF file of the current version of C57.131 and pasted directly into the Word document. This process was considered expedient for balloting but not adequate for final publishing. The figures will be redone prior to REVCOM submission.

1. The comment resolution committee will review and finalize the working group responses.
2. Along with this, we will revise the document as response to some of the comments.
3. We will upload the responses and conduct a recirculation.

The meeting was adjourned at 2:50 pm.

#### **7.6.1.5 WORKING GROUP FOR DEVELOPMENT OF PC57.150, GUIDE FOR THE TRANSPORTATION OF TRANSFORMERS AND REACTORS RATED 10,000 KVA OR LARGER –Greg Anderson, Chairman**

The WG did not meet. The document is nearly complete and a straw ballot of the WG will be held before the end of this year. A one-year extension to the PAR will also be requested.

#### **7.6.1.6 TASK FORCE FOR FUNCTIONAL LIFE TESTS OF DE-ENERGIZED TAP CHANGERS – Phil Hopkinson, Chairman**

The Task Force on Life Tests, De-energized Tap Changers was called to order at 9:35 AM on October 26, 2010. There were 40 attendees, 16 members, and 24 guests with 3 requesting membership. A quorum was not present. This TF has been in existence for a number of years. According to the roster there are 113 members. Regular attendance at meetings has been much lower – approx 25 members and 25 guests. An open action item from the last meeting is to send a message to the members using the listserv to confirm membership on the TF. There are no formal procedures to confirm TF membership and it was suggested to look at the attendance from the last 2 meetings and reset the membership. There were no patents to disclose. Reviewed the Agenda for the meeting, and the Minutes from the March 9, 2010, meeting in Houston, Texas, were approved.

1. The updated Dix slides on Test issues and results

Jeremy Sewell reviewed the updated Larry Dix presentation on Functional Life Test. Extended discussion on the test and latest test results.



Dix Presentation.pdf

There is a need to develop a guide on performing the test. This TF should move to become a WG

## 2. New Business

There was no new business.

The meeting adjourned at 10:50 AM.

### **7.6.1.7 WORKING GROUP FOR REVISION OF C57.135, GUIDE FOR THE APPLICATION, SPECIFICATION AND TESTING OF PHASE-SHIFTING TRANSFORMERS – Jin Sim, Chairman**

The Working Group met on Tuesday, March 9<sup>th</sup>, 2010 with a total of 13 in attendance. The group's membership is 31 so a quorum was not reached. The latest draft had been distributed to the group for a straw ballot and to the IEEE for editorial review and the comments from those reviews were discussed. The group discussed all of the IEEE recommendations and as many of the technical comments as possible during the meeting time and the consensus opinions of those discussions will be submitted to the full group via e-mail within the next couple of weeks for official resolution.

There were no objections to implementing all of the IEEE editorial review comments which covered standard formatting, the inclusion of an Abstract and Key Words, normative references and reference citations. All referenced citations will remain, but the reference to IEEE 100 will be deleted and the other references that are to be cited in the body of the document will be moved from the Normative reference section to the Bibliography. The discussions also led to a recommendation to include dual IEEE/IEC standard references for all reference citations in the text and to include the IEC standards in the Normative reference section as well.

Several graphical formatting issues and some figure numbering errors were pointed out by the straw ballot review and the group recommended their corrections. The use of the terms "primary" and "secondary" were questioned in the comments from the review and the group recommended that the document be reviewed to be consistent in using "S" and "L" to describe the PST terminals and to only use "primary" or "secondary" where they do not refer to the PST terminals (such as "CT secondary wiring...").

The discussions of the technical comments from the straw ballot review focused on the need to include a requirement for the specifier to include any requirements that they may have for phase angle shift under load. Further discussions showed that the specification of phase shifting transformers has other criteria to consider as well,

particularly if the phase shifter is required to match the operating properties of other PST's for applications like parallel operation or replacement of existing units. Mr. Sanjay Patel volunteered to draft a paragraph to include under Section 4.8.1 and as a brief tutorial under Section 12.3 to cover the details.

Jin Sim, Sanjay Patel, Joe Watson and Tom Lundquist will discuss the few remaining technical comments within the next week via conference call and include further recommendation for their resolution in the e-mail ballot.

**7.6.1.8 WORKING GROUP FOR REVISION OF C57.12.10, STANDARD REQUIREMENTS FOR LIQUID IMMERSED POWER TRANSFORMERS – Gary Hoffman, Chairman**

The Chairman reported that the revised Standard has been balloted and approved and will be published soon.

**7.6.1.9 WORKING GROUP FOR THE REVISION OF IEEE STD 638-1992, IEEE STANDARD FOR QUALIFICATION OF CLASS 1E TRANSFORMERS FOR NUCLEAR POWER GENERATING STATIONS – Craig Swinderman, Chairman**

Date: Tuesday, October 26, 2010 – 11:00 am to 12:15 pm.

Attendees: 2 members + 3 guests

The meeting began at 11:00 am.

The meeting minutes from the October 2009 meeting were approved.

The IEEE patent policy slides were shown. An opportunity was provided for the attendees to identify or disclose patents that may be essential for the use of the standard. No responses were given by the attendees of the meeting.

Topics discussed:

The latest version of the P638 document is now Draft #6. The revision of the document is now complete.

The current planned schedule for the working group is to have the document submitted for Mandatory Editorial Comment review in November 2010. At this time we will also start developing a balloting pool for this document. The IEEE PES Nuclear Power Engineering Committee (NPEC) will be included in the list of committees to participate in the balloting pool. The balloting is expected to be opened in the December 2010 to January 2011 timeframe.

The meeting adjourned at 11:30 am.

#### **7.6.1.10 WORKING GROUP FOR DEVELOPMENT OF PC57.153, GUIDE FOR PARALLELING TRANSFORMERS – Tom Jauch, Chairman**

Draft 1 was reviewed and comments were received. A Draft 2 will be issued before the next meeting in San Diego. A copy of the latest Draft is posted on the Transformer Committee website under the Power Transformers SC folder and users are invited to review the document and submit comments.

#### **7.6.1.11 TASK FORCE FOR TRANSFORMER TANK RUPTURE AND MITIGATION – Peter Zhao, Chairman**

A request has been submitted for a PAR and the first WG meeting will be held in San Diego next spring. People wishing to join this WG are invited to attend this meeting.

#### **7.6.1.12 TASK FORCE FOR DVP-GRID TRANSFORMERS – Hemchandra Shertukde, Chairman**

Revision continues on this document which will be issued as a position paper.

#### **7.6.1.13 TASK FORCE FOR WIND GENERATOR STEP-UP TRANSFORMERS – David Buckmaster, Chairman**

The Task Force on Wind Power Transformers was called to order at 8:05 AM on October 26. There were 83 attendees, 29 members, 54 guests with 9 requesting membership. A survey of members present was conducted and a quorum was present. There were no patents to disclose. The minutes from the meeting held March 9, 2010 was accepted as written.

### **1. Reports**

#### **1.1. Status of IEC 60076-16 (Paul Jarman)**

Mr. Jarman, IEC TC14 Chairman, reported that the IEC WG has met to address the comments received to the Committee Draft for Voting (CDV). The WG will meet again in late November to review document. It is expected that the FDIS will be circulated in December 2010/January 2011. Final document is expected to be published in Summer 2011.

For IEC documents, FDIS stage is probably safe for this TF to move forward.

#### **1.2. Normative Document Cross Reference to IEEE (Matt Lawson)**

Mr. Lawson was not present to provide an update.

#### **1.3. Arc Flash Questionnaire (John Crotty)**

Mr. Crotty reported that no additional feedback has been received.

## 2. Review of Comments received to IEC 60076-16

Reviewed the comments received by TF members to the proposed IEC 60076-16.



IEC 60076-16  
Comments.doc

Some members of the TF have not seen the comments. They will be posted to the IEEE website.

It was recommended to submit these comments to the IEC WG for consideration. It is late in the IEC process, so there is no guarantee that they will be addressed but they should be made aware of them for future revisions.

## 3. Preparation for Spring 2011

Will need to develop by February 28, 2011:

- Name of WG
- Purpose Statement
- Scope

## 4. New Business

There was no new business.

Next in person meeting will be at the Spring IEEE Transformer Committee meetings in San Diego. The meeting adjourned at 9:09 AM.

### **7.6.2 OLD BUSINESS**

None

### **7.6.3 NEW BUSINESS**

#### **C57.140 - IEEE GUIDE FOR THE EVALUATION AND RECONDITIONING OF LIQUID IMMERSED POWER TRANSFORMERS - Rowland James Chairman.**

The Guide is up for re-affirmation and will be balloted but several comments and recommendations are expected so the Chair will submit a PAR request and form a new WG for revision of the Guide. The first WG meeting will be held during the spring 2011 meeting in San Diego and people wishing to join the WG are invited to attend this meeting.

**C57.117 and C57.125** – The reaffirmation of these two documents will be combined under one document.

**C57.17** - Bob Ganser was appointed as the new Chair of the WG for the revision of this document.