10.8 Dry Type Transformers SC **Chair Charles Johnson**
Acting Secretary Casey Ballard

10.8.1 Introductions and Approval of Minutes

The Dry Type Transformer Committee meeting began at 1:34pm Wednesday, November 2, 2011 in the Pacific "FGH" rooms of the Renaissance Waterfront Hotel In Boston Massachusetts with introductions of members and guests. There were 15 members (out of 29 on the roster, therefore a quorum was reached with 51.7%) and 15 guests present. The meeting minutes for the San Diego, CA meeting (Motion: Phil Hopkinson Second: Mark Gromlovits) were approved. The Chair asked if anyone knew of any patent related issues; none were identified.

10.8.2 Working Group/Task Force Reports

The next order of business was the presentation of the reports of the various working groups and task forces. See the following sections for the individual reports:

10.8.2.1 WG PC57.12.01 - Dry Type General Requirements **Chair Tim Holdway**
Secretary Casey Ballard

The working group met in the Pacific C Room of the Renaissance Boston Waterfront Hotel

The meeting was called to order at 11:03 AM by Chairman Tim Holdway.

The meeting was convened with fourteen (14) members (out of 21 – therefore a quorum was reached with 67% attending) and 12 guests present with 1 requesting membership.

The minutes of the San Diego April 11, 2011 meeting were approved.
Motion: Mark Gromlovits
Second: Chuck Johnson

Attendees were asked if they knew of any patents that may be related to the work of this working group. No patents or patent claims pertinent to C57.12.01 were identified by working group members.

Old business

Nameplate
Tim Holdway stated that no nameplate requirements will be placed into C57.12.01 unless the DOE or NEMA specifically requires them. Any manufacturer that wishes to include text relating to DOE is free to do so.

Partial Discharge
Rick Marek presented a power point using data provided from several manufacturers. The presentation outlined the differences in the current IEEE and future IEEE testing methods relating to time and percent of rated voltage. He then showed the raw data for layer and disk windings. The layer windings had < 25pC for all reported measurements. The disk windings had (3) 'fliers' that were above 100pC and the group discussed the origin of such a PD measurement. It was the general consensus that the PD was external to the windings, but this could not be verified since the waveforms were not supplied to Rick Marek for analysis. A brief discussion followed on the appropriate PD level for Open Wound transformers. Mark Gromlovits made a motion of 50pC for all Open Wound with a second from Carl Bush. The motion passed with 9 for and 2 against.

No Load Loss Correction
In San Diego a motion carried that all no load losses should be corrected to 20°C. After that meeting Casey Ballard questioned how the losses should be corrected. He supplied the correlating calculation from C57.12.90 Section 8.4 for discussion. No one present could confirm how the WG for C57.12.90 had determined the equation for loss correction and no actions were assigned to locate the answer. Chuck Johnson questioned the 20°C in lieu of 75°C and Sheldon Kennedy noted that the WG for 12.00 had attempted such a change in the past that was not supported by the end users. No motions were made. The group agreed that the no load loss correction equation belonged in 12.91, but since that document is out for ballot it will not make it into the next revision. Tim Holdway agreed to determine the proper vehicle for including this calculation into a dry type standard.

Altitude Correction
The group agreed that a change was needed to allow for the correction of the dielectric insulation levels for altitude. However, the group could not agree on the proper calculation since this correction would be based on a complex insulation system of solid insulation and air. Tim Holdway proposed the use of the Table 1

'as is', provide additional wording to explain its use, and add example(s) to the Annex. Tim will circulate his proposal before the spring 2012 meeting.

Miscellaneous Proposed Changes
Marcel Fortin agreed to review Tim's response to his required changes so that all of them could be addressed before the spring 2012 meeting.

Aleksandr Levin had sent to the Chairman a few of his concerns/proposed changes. Tim had sent these out to the members a few days before this meeting. Tim asked that all members please review these proposals and give their comments so we can resolve before the next meeting.

New business

No new business was raised due to time constraints

Next meeting: Spring 2012: March 11 – 15 Nashville, Tennessee

With no further business, the meeting was adjourned at 12:17 PM.
Motion: Mark Gromlovits
Second: Chuck Johnson

10.8.2.2 WG PC57.12.91 - Dry Type Test Code — Chair Derek Foster

The working group met at 3:15 pm in the Pacific C Meeting Room of the Renaissance Waterfront Hotel in Boston, Massachusetts with 10 members and 9 guests present.

There were no patent issues regarding this standard.

The minutes of the last meeting, held in San Diego, were approved as written.

Old Business

The recirculation ballot for this standard, held in early October was successful, with 91% of ballots returned, and 86 affirmative votes of the 92 returned. The document will now be reviewed by RevCom at its December 6th meeting.

Since work on the current revision is now complete, the meeting was spent reviewing several topics which should be considered during the next revision.

These included temperature rise test procedures, short circuit tests, partial discharge tests, dielectric tests for transformers used at high altitudes, and audible sound level measurements.

For the temperature rise test procedures David Vinson and Carl Bush agreed to review this section of the standard.

Marcel Fortin will lead a task force to review short circuit tests.

Marcel also mentioned some topics which are being reviewed by the C57.12.90 task force, and which we may also want to review. These included resistance measurements and impulse voltage wave tail time for low impedance windings.

Regarding partial discharge tests, there was a short discussion on whether to include the contents of C57.124 IEEE Recommended Practice for the Detection of Partial Discharge and the Measurement of Apparent Charge in Dry -Type Transformers, into this document, or whether to include just a reference to C57.124. This will be decided during the revision process.

During the balloting process, a number of comments were received regarding the quality of some of the drawings in the standard, so all drawings and diagrams will be reviewed during the next revision and redrawn where necessary. Casey Ballard agreed to assist with this task.

Casey had raised a question regarding the reference temperature to be used for no load losses and the temperature correction formula to be used. This item is also being considered by the C57.12.01 working group, so we will work with that group on this subject to ensure consistency between the two standards.

The meeting ended at 4:10 pm.

10.8.2.3 WG PC57.12.52 - Sealed Dry Type Power Transformers — Chair Sheldon Kennedy

The Working Group met on Monday, October 31, 2011 at 9:30 AM with 11 members and 6 guests present. Sheldon Kennedy chaired the meeting. We had a quorum for the meeting.

The IEEE disclosure statement was read. There were no patents pertaining to this standards work for which any members had awareness.

Minutes of the April 11, 2011 meeting in San Diego were approved.

Draft 5 of the document was balloted.

We had met the requirement for a valid response ballot with 82 % returned. We had 96% approval rate. We have 57 comments to resolve, 9 must be satisfied. There are 3 negative ballots which must be addressed. That is what we will spend our time on.

Ballot Open Date:	19-Aug-2011
Ballot Close Date:	18-Sep-2011
Type:	New
Draft #:	5
Comments:	57
Must Be Satisfied Comments:	9

RESPONSE RATE

This ballot has met the 75% returned ballot requirement.

95 eligible people in this ballot group.

73 affirmative votes

3 negative votes with comments

0 negative votes without comments

2 abstention votes: (Lack of expertise: 2)

78 votes received = 82% returned, 2% abstention

APPROVAL RATE

The 75% affirmation requirement is being met.

73 affirmative votes

3 negative votes with comments

76 votes = 96% affirmative

The Working Group reviewed the comments received in the ballot of Draft 5. After a review of the comments and possible responses it was decided to re-circulate the modified draft to see if it is acceptable to the Working Group. We will allow a two week period for this. Assuming that is successful we will do a formal re-circulation ballot in the IEEE.

There were no other comments.

There was no other old business or new business.

The meeting was adjourned at 10:30 AM.

10.8.2.4 WG Dry Type Loading Guide C57.96 **Chair Rick Marek**

The fourth meeting of the working group was held in the Pacific C of the Renaissance Waterfront Hotel in Boston, MA at 1:47pm with 11 members and 8 guests in attendance. Introductions were made, and the attendance sheet was passed around. With 17 members there was a quorum and the minutes of the last meeting were approved as submitted.

The Chair presented an overview of the 2nd draft and commented on the overall structure of the document. It included some copy/paste information for discussion during the meeting that will not remain in the 3rd draft.

It was brought up that two definitions were missing from Section 3 - Open Wound Dry Type Transformers and Sealed Dry Type Transformer. The Chair asked for three volunteers to submit their proposals and Aleksandr Levin, Chuck Johnson, and John K. John volunteered.

The discussion then moved to Table 1, “Continuous per unit loading capability as a function of ambient temperature”. A question was raised on the ambient temperature level for Table 1 and it was confirmed that it was 30C based on paragraph 4.2 which describes transformer rated output. Mark Gromlovits asked why a 240C insulation system was not included in the document, but declined to make a motion. The Chair advised that inclusion of insulation systems should be addressed in C57.12.01. The attendees of the meeting could not determine what equation was used to develop Table 1 and Sanjib Som volunteered to create the required equation.

A discussion was then held on Table 2, “Influence of altitude on loading”. The attendees of the meeting could not determine what equation(s) was used to fill out Table 2 and Aleksandr Levin and Dhiru Patel volunteered to create the required equation(s).

The life equations were discussed and the chair noted that the variables were based on industry-accepted values. The new document will have similar values, but a manufacturer could use different values based on their internal test data. The chair encouraged the members to review the equations and send him comments.

Chuck Johnson requested that the core temperature estimate in Section 5.3, Page 14, Line 3 be revised to include the text “, other values may be used if test data is available”

The question if the impact of moisture should be included in this guide was raised, but the allotted time for the meeting was exceeded and no discussion occurred.

The Chair agreed to make the discussed changes, remove the duplicate data/tables as referenced above and send to the WG by 1Q12.

Two guests requested membership.

The meeting adjourned at 3:05pm.

10.8.3 Old Business

There was no old business.

10.8.4 New Business

The chair noted the upcoming dates for the NESCOM submittal

The chair covered the status of the Dry Type standards and noted the documents had revision due dates or PARs expiring in 2011.

Paulette Powell has volunteered to lead the development of the following standards. She has submitted a PAR for each document.

C57.12.59 – Through Fault Current Duration
C57.134 – Dry Type Hot Spot

Dave Stankes has volunteered to chair a task for for the revision of C57.94. The task force will have the following members

Derek Foster
Tim Holdway
Roger Wicks
Rick Marek
Sanjib K. Som

Being no further business, a motion to adjourn as made by Tim Holdway and seconded by Roger Wicks

Meeting adjourned at 2:18