

Dry Type Transformers Subcommittee – Unapproved Meeting Minutes
October 8, 2008 – Porto, Portugal

8.7 Dry Type Transformers SC

Chair Charles Johnson

8.7.1 Introductions and Approval of Minutes

The SC meeting was held at 2:30 pm on Wednesday, October 8 2008 in 3 Rios, Piso 1 of the Porto Palácio Congress Hotel, with 6 members and 9 guests. The minutes from the Charlotte meeting were approved as written.

8.7.2 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:

8.7.2.1 WG Dry Type Thermal Evaluation C57.12.56/60

Chair Roger Wicks

The working group met in Porto, Portugal at the Porto Palácio at 2:45 PM on Monday, October 6, 2008 with 5 members and 12 guests present, with two guests requesting membership. Attendees introduced themselves and signed a roster.

The Chair reviewed the minutes from the last meeting, which were approved as read. The chair reviewed the patent documents for our meeting, and no patent related issues were noted for the work of this working group.

The Chair provided an update to the status of the document. A ballot was conducted of the dry-type subcommittee and comments received from that ballot were incorporated into the document. The Chair reviewed these, mostly editorial changes, which should help with the official ballot to be submitted soon.

Chuck Johnson, DT Subcommittee chair noted that C57.12.56 (open wound standard) has been extended for one year to allow completion of our work.

Finally the chair showed the updated pictures for the document and solicited help from the Working Group to put them into a better form and Don MacMillan volunteered to help.

With this, the meeting adjourned at 3:05 PM.

8.7.2.2 WG for Revision of IEEE C57.16: Dry Type Reactors

Chair Richard Dudley

The W.G. for the Revision of IEEE C57.16 (Dry Type Reactor T.F.) met on Oct. 6, 2008 at 9:00 a.m. in the Corgo Meeting Room, of the Porto Palacio Congress Hotel in Porto, Portugal. There were 11 members and 9 guests present. The following are the highlights:

1. Introductions were made.
2. The minutes of the Charlotte W.G. meeting were approved.

Note: The minutes of the Porto meeting won't be approved until the meeting of the W.G. in Miami, Florida.

3. There are no patent issues re the revision of IEEE C57.16.
4. The remainder of the meeting focused on the revision of IEEE C57.16, and in particular, discussions on Draft #2 prepared and distributed by the Chairman prior to the meeting, including comments received prior to the W.G. meeting. The following are the highlights:

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- a. Annex F covering possible circuit breaker TRV issues associated with the application of current limiting reactors was discussed. The background behind the issue will be better described in Annex F and also in the “Introduction” to the revised standard. In simple terms, one of the purposes of using a current limiting reactor is to protect the circuit breaker from fault current beyond its s.c. rating, but in applying the current limiting reactor, the TRV capability of the circuit breaker might be exceeded. The example in F8 will be expanded to illustrate the use of current limiting reactors in NA distribution systems vs European distribution systems; NA – CLR, circuit breaker, feeder vs Europe circuit breaker, CLR, feeder. An additional figure will be added. Neutrals are treated differently in Europe vs NA. Also the type of/and usage of fuses is different; expulsion fuses vs current limiting fuses. Klaus Pointner and Pierre Riffon will provide input.
- b. The turn-to-turn test was discussed. The turn-to-turn test has been extended to 138kV systems and is the preferred test vs the lightning impulse test. It should also be described as an alternative vs as being equivalent to the impulse test. More detail will be provided re the turn-to-turn test such as the range of size of the capacitor to ensure a reasonable “ringing” frequency and hence duration of voltage application per decaying sinusoidal envelope. For system voltages ≤ 34.5 kV (≤ 200 kV BIL), the test voltage will be applied to one terminal only; as is now required in the current published version of IEEE C57.16. For critical reactors employed on system voltages > 34.5 kV (> 200 kV BIL), the duration of the turn-to-turn test should be divided into two equal parts; 30 seconds per terminal. This also holds for reactors where the BIL is lower than 200kV due to the use of LAs but are installed at system voltages > 34.5 kV. Note 2 of Table 5 partly addresses the issue but may have to be modified.
- c. Pierre Riffon’s proposal for an optional impulse design test was discussed; including the requirement of 15 full waves of positive polarity applied to each terminal. This option is not intended for lower system voltage (“less critical”) reactors but for “critical” transmission class series reactors. No consensus was reached, but Pierre Riffon will provide additional background wording for his proposal.
- d. The switching impulse is only applicable for reactors employed on system voltages 230kV and above.

The chairman agreed to provide Draft #3 by early 2009, but requires denoted inputs as soon as possible.

The meeting adjourned at 10:13 a.m.

8.7.2.3 IEEE PC57.12.52 - Sealed Dry Type Power Transformers

Chair Sheldon Kennedy

The Working Group met on Monday, October 6, 2008 at 10:30 AM with 4 members and 5 guests present. Sheldon Kennedy chaired 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 March 17, 2008 meeting in Charlotte were reviewed and approved.

The Chair announced that we were beginning work on C57.12.52, which had been approved as a PAR by IEEE. The PAR was granted on May 7, 2007 and will expire on December 31, 2011.

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The Chair reminded everyone that this was an old NEMA document that had been brought into IEEE and needed to be changed to the IEEE format. Also, the document is old and much of the information is outdated.

The document was reviewed through clause 5.7 at the last meeting. At the last meeting we weren't sure how to proceed on clause 5.7 that dealt with differences in pressure limitations on the tank for other gases other than dry air or nitrogen. Freon is no longer used for this application. It was decided that since no other gases other than dry air or nitrogen are being covered in this document we should just eliminate this clause.

In clause 5.8 we will remove the comments about other dielectric gases in relation to a shut off valve, but will maintain the requirement for a shutoff valve.

Clause 5.10 made a welded cover. This will be revised. A welded cover will be standard, but a bolted gasketed cover may be specified.

Clause 5.10.2.1 gives specific information for tank pressure and vacuum requirements for other dielectric gases other than nitrogen or dry air. This clause will be removed and 5.10.2.2 will become 5.10.2.1.

Clause 5.10.3.2 gave information about lifting facilities. Subhas Sarkar will review this clause for possible revision.

Figure 4 under 5.10.3.3 Jacking Facilities did not reproduce in the document conversion. It will be added.

Clause 5.10.4 Ground Pad will be reviewed for language with other more current standards. Part II of this document needs to be rewritten from the NEMA format of Part I and Part II to a continuation of the document. These clauses deal with other requirements and alternatives.

Clause 8.1.1 will be eliminated as written and we will refer to the loading guide, C57.96 for other ambient conditions. The existing clause is very specific to a 40 C average ambient with a 50 C maximum ambient condition.

Clause 8.1.2 regarding other minimum ambient temperatures will be eliminated.

Clause 8.2, 8.2.1 and 8.2.2 will be eliminated as they refer to outdated winding temperature rise conditions. This is covered in C57.12.01 and does not need to be repeated.

Clause 8.3 referred to other insulation systems which are now outdated. This clause will be removed as it is covered in C57.12.01.

Clause 8.4 .2 referred to other high-voltage ratings. These are covered in C57.12.01, so it will be referred to and the rest of the of the clause will be removed.

Clause 8.5.1 discusses other kilovolt-ampere, voltage and BIL combinations. The language will be removed as it is out of date and we will refer to C57.12.01.

Clause 8.5.3 discusses the angular displacement of Y-Y connected transformers. We will remove the language and refer to C57.12.01.

Clause 8.5.4 will be retained but re-titled as "Neutral Connections of Y-Y Connected Transformers".

Clause 8.7 discusses other options BIL levels. The table is out of date and we will eliminate it and refer to C57.12.01.

Chuck Johnson volunteered to review the last three pages of the standard and make comments. The chair will circulate these to the working group members for comment. Agreed upon changes will be incorporated into the new draft document.

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There was no other old business or new business.

Time expired and the chair asked members to continue to review the document for proposed revisions. The meeting was adjourned at 11:45 AM.

8.7.3 Old Business

There was no old business

8.7.4 New Business

The SC chair conducted a review of all Dry-Type standards to determine their present status and identify what actions and resources would be needed in the future.

The chair then discussed the immediate need for a SC secretary and additional WG chairs and that he was asking for volunteers. After the meeting, Lewis Powell volunteered for the position as secretary; the chair accepted his offer and will inform the Administrative SC.

Kip Yule discussed an issue he had noted during the witnessing of thermal tests for a dry transformer at a manufacturer. Although both HV and LV windings were within the specified value, Kip stated that the measured temperature rise of the LV winding was 25° C lower than the HV winding. Kip's concern was that if the temperature monitoring device's "fan-on" relay is set at the normal temperature and the temperature probe is placed in the LV winding, the possibility exists that the HV winding could overheat and the maximum insulation temperature could be exceeded in that winding. The matter was discussed with the SC and as an action item, the chair will discuss the issue with John Sullivan, chairman of the WG for C57.12.01. Kip will also forward his comments to John Sullivan.

There being no further business, the meeting was adjourned at 3:40pm.