

Dry Type Transformers Subcommittee – Unapproved Meeting Minutes
April 22, 2009 – Miami, Florida

8.1 Dry Type Transformers SC

Chair Charles Johnson

8.1.1 Introductions and Approval of Minutes

The Dry Type Transformer Committee meeting began at 1:30pm Wednesday, April 22 in the Concerto C/D room of the Miami Hilton Downtown with introductions of members and guests. There were 10 members and 8 guests present. The Chair introduced the new SC secretary, Lewis Powell. Paulette Powell made a motion to approve the minutes of the Porto meeting; Roger Wicks seconded and the WG approved. The Chair then asked if anyone knew of any patent related issues; none were identified.

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:

8.1.2.1 WG Dry Type Thermal Evaluation C57.12.56/60

Chair Roger Wicks

The WG did not have a meeting. Roger has editorial comments from IEEE and said he is struggling to get the draft in the IEEE format. Casey Ballard will supply coil drawings for inclusion in the draft.

8.1.2.2 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 April 20, 2009 at 8:00 a.m. in the Tenor Meeting Room, of the Hilton Miami Downtown Hotel, in Miami, Florida. There were 13 members and 8 guests present. The following are the highlights:

1. Introductions were made.
2. The minutes of the Porto, Portugal W.G. meeting were approved.

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

3. There are no patent issues re the revision of IEEE C57.16.
4. The remainder of the meeting focused on Draft #3 of the Revision of IEEE C57.16, and outstanding input received on the previous Draft #2.
 - (i) WG consensus supported the Chairman's proposal to handle the proposed extension of the turn-to-turn test to BIL's up to 550 kV in Note 6 of Table 5 and a NOTE in Clause 11.3.5.1. Due to the fact that fully commercialized test agreement is not readily available, the turn-to-turn test can be extended to BILs above 200 kV based on availability of test equipment and agreement between purchaser and manufacturer.
 - (ii) The Chairman's proposal to handle the optional impulse design test consisting of 15 shots of positive polarity in a NOTE in Clause 9.3.3 and a NOTE in Clause 11.3.6 was accepted. Wording will be added that the test is only applicable to sub-transmission and transmission class reactors. Due to the statistical nature of the test, 2 flashovers allowed out of 15 shots, it is also recommended to perform the test on a "mock-up" since a flashover could involve the non restoring insulation of the reactor under test. The NOTE in Clause 9.3.3 should be "tabbed".
 - (iii) All NOTES in the Revision of IEEE C57.16 should be "tabbed"
 - (iii) Pierre Riffon's draft discussion on the differences between European and North American distribution systems and the need for CLRs in North American distribution systems will be included in Annex F which covers potential CB TRV issues associated with the application of CLRs. Suitable technical papers will be referenced; including one by Jan Car. The impact of the

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location of the CLR with respect to the CB will be included; reactor after CB creates a potential fault current magnitude risk to the CB vs no risk to the CB if the CLR is before the CB. The CB application guide will also be referenced.

- (iv) In the Introduction to Annex F and also in the “Introduction” of the revised standard, the rationale for including Annex F will emphasize that it is based on the fact that capacitors used to mitigate the TRV seen by a CB, due to the application of CLRs, are often part of the scope of supply of the reactor; and may even be mounted inside distribution class CLRs. HV series reactors often have separately mounted HV capacitors; again also part of the scope of supply of the reactor.
- (v) Reactors used in shunt capacitor banks may impact the TRV seen by CBs. Peter Balma will provide input.
- (vi) Devki Sharma will bring up the purpose of Annex F at the next CB SC meeting of the IEEE Switchgear Committee. He will solicit input from CB SC members such as Ken Edwards.
- (vii) The chairman will provide Devki a copy of Draft #3 ASAP. Devki Sharma will become a member of the WG.
- (viii) Information in E.7 “Connections” on short circuit was deemed sufficient by the WG.
- (ix) Measurement of the inductance of 3 phase stacked filter reactors will be included in Annex A; including zero, positive and negative sequence at fundamental and harmonics. Xiangfu Guo & Klaus Papp will provide input.

6. The revision of the SR switching guide will go out for ballot in the near future and Dry Type TF members are encouraged to participate.

7. The Chairman stated that he would include the preceding in Draft #4. Since the Revision of IEEE C57.16 is essentially complete, the Chairman requested that WG members start to focus on editorial corrections that could be included in Draft #4. Draft #4 will be distributed well before the October 26, 2009 meeting in Lombard,

The WG adjourned at 9:15 a.m.

8.1.2.3 IEEE PC57.12.52 - Sealed Dry Type Power Transformers

Chair Sheldon Kennedy

The Working Group met on Monday, April 20, 2009 at 9:30 AM with 7 members and 4 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 October 6, 2008 meeting in Porto, Portugal were reviewed and approved.

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 though Clause 8.7 at the last meeting. Chuck Johnson had volunteered to review the last three pages of the standard and make comments. These were discussed.

Clause 9.1 and 9.2 on High Voltage and Low Voltage Connection arrangements will be deleted since it limits the transformer construction and these transformers are built in several styles of transformers today.

Clause 9.3 on Surge Arresters will remain.

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Clause 9.4 on Unit Substation applications will remain but be checked with C57.12.70 for correctness. The first paragraph will be kept and the second paragraph on tap changers will be deleted.

Clause 9.5 on Pressure Alarm Switches will be kept but reviewed for correctness.

Clause 9.6 on High Temperature Alarm Switch's will be kept but reviewed for correctness.

The second sentence of Clause 9.7 concerning Current Transformers will be deleted.

Clause 9.7.1 will be modified to say "If specified, but when no other details are given, single-ratio current transformers with relay accuracy class shall be provided."

Clause 9.7.2 will be modified to say "If specified, but when no other details are given, current transformers shall be multi-ratio with relay accuracy class (full winding) and taps as specified by ANSI/IEEE C57.13.XXXX.

Clause 9.8 will be reworded to "When specified, enclosed terminal blocks shall be located in the low voltage segment, unless specified otherwise."

Clause 9.8.1 and 9.8.2 will remain as is.

Clause 9.9 will be eliminated.

Clause 10 Other Tests – Will be reworded to refer to the latest version of C57.12.01-XXXX.

This completed the review of the document. The Chair will submit a new Draft 2 to the Working Group to review.

There was no other old business or new business.

The meeting was adjourned at 10:30 AM.

8.1.2.4 IEEE PC57.12.91 - Dry Type Test Code

Chair Derek Foster

- 1 The working group met at 3:15 pm with 6 members and 6 guests present.
- 2 There were no patent issues regarding this standard.
- 3 The minutes of the last meeting, held in Charlotte, were approved as written.
- 4 Old Business

The Chairman reminded the Working Group that the PAR for revision of this standard has been approved until December 2010.

The revision includes four sections of the standard, resistance measurements, dielectric tests, temperature rise test and audible sound level measurements.

The first three of these sections have been discussed during the last several meetings and revisions have been agreed on by the Working Group, so the meeting was spent on a final review of these sections prior to going out to ballot.

There was some discussion regarding the note to clauses 11.6 and 11.7. This note had been changed for this revision to make it consistent with a similar note in the section of the standard on resistance measurements. But

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the second sentence of this note refers to a value to be used for Tk for the correction of stray losses and it was decided to remove this sentence since clauses 11.6 and 11.7 refer to calculation and correction of temperature rise values only.

The section of the standard on audible sound level measurements was to be replaced by the revised document received from the Audible Sound and Vibrations subcommittee, but this document has been delayed pending further revision. So it was decided to proceed to ballot the standard without this revision.

5. There being no new business, the meeting was adjourned at 4:20 pm.

8.1.2.5 IEEE PC57.12.01 - Dry Type General Requirements

Chair Tim Holdway

The working group met in the Tenor room of the Hilton Miami Downtown.

The meeting was called to order at 11:05 AM by Chairman Tim Holdway

The meeting was convened with nine (9) members and six (6) guests present.

After the introductions were made, Charles Johnson informed the group that Chairman John Sullivan had called and informed him that he was resigning his position as Chairman effective immediately. Chuck then introduced the new Chairman, Tim Holdway.

The minutes of the Charlotte March 17, 2008 meeting were approved.

Motion: Chuck Johnson

Second: Mark Gromlovits

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

Table 5

During the Charlotte meeting, a discussion of removing Note “a” from Table 5 was discussed. It was decided in Charlotte that note “a” was only applicable to the two tables published in the previous edition of C57.12.01. Table 5 replaced these two tables in C57.12.01-2005. Note “a” was inadvertently brought forward into the 2005 issue of the standard during revision. During this meeting, Phil Hopkinson also added that the low frequency test levels in Table 5 were not only higher than the levels of C57.12.00 for liquid, but they were also above the typical level the equipment would see once installed with the exception of fast transients caused by switching. Chuck Johnson noted that he was aware of few, if any, test failures had occurred since the low frequency test levels were modified.

The working group agreed by consensus to eliminate note “a” in Table 5 and to leave the low frequency levels as they now appear. The Chair will pursue obtaining an erratum as a carry over action from the last meeting in Charlotte on March 17, 2008.

Partial Discharge

Yunxiang Chen opened this discussion in Charlotte. Chuck Johnson and Mike Iman summarized the previous discussion since Yunxiang Chen was not present.

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Chuck Johnson reminded the group that reaffirmation of C57.124 IEEE Recommended Practice for the Detection of Partial Discharge and the Measurement of Apparent Charge in Dry-Type Transformers was upcoming and any changes to C57.12.01 should correlate with this standard

The discussion centered around Section 5.10.3.5 and Table 6. The previously discussed procedures and measurement levels from Charlotte were questioned after the minutes were approved. Charles Johnson again proposed harmonization with IEC and Ray Bartnikas added that the level of 10pC was close, but within, the threshold of measuring equipment. Mark Gromlovits suggested that a low level, such as 10pC, would require manufacturers to purchase new, more expensive equipment and that investment could put smaller manufacturers in financial risk.

Phil Hopkinson suggested that the 10pC level was too low, but would support keeping the description that allows ‘coils only’ testing with customer approval.

The attendees agreed that further discussion should involve the two people who drove the discussion in Charlotte – Yunxiang Chen and Rick Marek. Yunxiang will be contacted by Derek Foster and Rick will be contacted by Charles Johnson to get their input and invite them to the next meeting in Chicago. The general agreement was Section 5.10.3.5 and Table 6 could be simplified to describe the voltage levels as a percentage, duration, and definition, in pC. Mark Gromlovits agreed to propose new wording and test levels to be sent to Tim Holdway for distribution to the working group members for review before the next meeting.

Proposal for a change to paragraph 4.2.5

Rick Marek presented his proposal to revise clause 4.2.5 at the Charlotte meeting. Rick was not present at this meeting and his proposal was not discussed. Rick will be asked to attend the next meeting by Charles Johnson to describe his proposal in detail.

New business

There was no new business

Next meeting: Fall 2009: October 25-29 – Lombard, Illinois USA

With no further business, the meeting was adjourned at 12:10 PM.

8.1.3 Old Business

There was no old business

8.1.4 New Business

The chair provided the following status of standards:

Expiring in 2009: C57.12.60 , C57.96, C57.124, and C57.259.

Expiring in 2010: C57.12.01, C57.12.91, C57.16, and C57.94.

Expiring 2011 C57.12.52, C57.12.59, and C57.1.34.

Expiring In 2012 C57.12.51, C57.12.58

Additionally there are two NEMA documents to be revised . C57.12.50 and C57.12.55.

Rick Marek, discussed his proposed rewording for altitude correction for C57.12.01 and C57.12.91.

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Being no other business, the meeting was adjourned at 2:45pm.