10.2 Distribution Transformer Subcommittee Report

Ken S. Hanus - Chairman
ken.hanus@ieee.org

The Distribution Transformer Subcommittee has a total of 9 active working groups/task forces, 7 of those met in Minneapolis.

Subcommittee Meeting Wednesday October 17, 2007 at 3:00 pm
Members 28
Guests 27
TOTAL 55
6 Requests for membership

10.2.1 Chair's Remarks & Announcements:

Review of Administrative Committee meeting highlights

- Future Meetings
- The Unapproved Dallas minutes were approved with no corrections.

10.2.2 Working Group Reports

10.2.2.1 C57.12.20 Overhead Distribution Transformers

Alan Wilks & Tommy Cooper Co Chairs
awilks@ermco-eci.com & Tommy.cooper@faypwc.com
PAR Status: Approved 9/15/2006
PAR Expiration Date: 12/31/2010, Current Standard Date: 2005
Current Draft Being Worked On: D1
Meeting Time: 9:30 am, Monday, October 15, 2007
Attendance: 43 Total
20 Members
23 Guests

Alan Wilks called the WG C57.12.20 meeting to order at 9:30, introductions were made and rosters were circulated. The unapproved minutes of the spring 07 meeting in Dallas, Tx were reviewed and approved. Alan then reminded everyone of the IEEE policy on patents and asked if anyone had any patents to declare, none were declared.

Old Business:

1. The PAR status – PAR is effective until 12/31/2010.
2. Alan updated us on the moving of the Dielectric Test of grounded wye transformers to C57.12.90 and C57.12.00. The Low Frequency WG wants us to word the procedures for them. After some discussion, Alan agreed to put together the wording and send it to the WG members for comment.
3. Alan reviewed the ballot on the rewrite of Section 9, there was no conclusions from the ballot. Based on the results from the ballot and after much discussion, Alan put the two balloted items to a vote of the members present:

a. On the issue of the arc starter wire size, 13 members voted to set the wire size at 18 AWG or smaller, and 6 members voted against using 18 AWG or smaller.

b. On the issue of changing the duration of the fault, 17 members voted to keep the duration at ½ to 1 cycle, and 1 member voted to not keep the duration the same.

Conclusion, the new draft will show the arc starter wire size as 18 AWG or smaller and the duration will stay the same as ½ - 1 cycle. Ken Hanus volunteered to improve the English of Marcel's wording of Section 9 that defines a "fault" and a "test".

4. Rich Hollingsworth covered his proposed changes to the style of hanger brackets. The members voted unanimously to go with Rich's #2 proposal which keeps the dimensions from the pole the same and eliminates the "Vee" look.

5. Guiseppe to complete his survey of EEI members on changing the hanger bracket spacings to allow a shorter spacing on small 3-phase units with "A" support lugs.

   Also, Steve Shull wanted to add 15 KVA 3-phase to Table-1, this was put to a vote and everyone agreed.

6. Item on tolerances for arrester nut dimensions was carried forward to the Spring 08 meeting.

The meeting was adjourned at 10:45.

10.2.2.2 C57.12.38 Single-Phase Padmounted Distribution Transformers
Combined C57.12.25 & C57.12.21
Ali Ghafourian & Ignacio Ares Co Chairs
aghafourian@ermco-eci.com & Ignacio_ares@fpl.com
PAR Status: Approved 12/08/1998 (For combining Standards C57.12.25 & C57.12.21)
PAR expiration Date: 12-31-2009
Current Standard Date: 1995
Current Draft Being Worked on: D6.1, Dated: March 2006
Meeting Time: 11:00am, Monday, October 15, 2007
Attendance: 40 Total
23 Members
17 Guests

Introductions were made and the roster was circulated.

The IEEE Patent Policy was reviewed and there were no patents cited.

The meeting minutes from the last meeting in Dallas (3/12/07) were approved.

Ali reviewed the IEEE ballot that was conducted during Sept 2007.
Ballot pool – 75 persons
Response Rate – 82% (exceeds the required rate of 75%)
Approval Rate – 95%
3 - Negative Votes w/comments
9 - Affirmative Votes w/comments

62 – Total Comments

Ali started reviewing negative comments.

1. Figure 2b – Should be 17" not 171" for opening depth.
2. Note 4 of Figure 4 – Should be 4A and 4B, not 3A and 3B.
3. Table 2 Dry withstand values – Inconsistent with the old C57.12.21 and the current C57.12.00. Voted to change to 12.00 values (17200 becomes 18000, 34kV becomes 35kV, 40kV becomes 42kV)
4. Section 9.3.1 – Figure references need to be in caps. Ali will check IEEE Style Manual.
5. Section 9.2.5 – Voted to change the first part of sentence from "On phase-to-ground connected transformers," to "Since the transformers are connected phase-to-ground,".
6. Section 9.2.4 – Old C57.12.21 specified #8 – 2/0, not #6 – 250kcmil. Voted to go back to previously specified #8 – 2/0.
7. Section 8.5 – Unclear as to which requirements apply only to double door designs. Ali to clean-up wording.
8. Section 7.2 – Voted to change the first sentence back to that of C57.12.25-1990, since the standard only covers transformers with a permanently grounded H2.
9. Section 1.1 and Figure 3 – Voted to add "live front" to Section 1.1 (Figure 3) and to the title of Figure 3.
10. Section 12 – Pressure relief venting pressure is higher than the tank withstand without permanent distortion (Section 11.2). Voted to leave as is.

The meeting adjourned at 12:20pm

Respectively submitted by: Alan Wilks (for Ignacio Ares)

10.2.2.3 C57.12.28, C57.12.29, C57.12.31 & C57.12.32 Cabinet integrity Standards

Bob Olen & Dan Mulkey Co Chairs
bolen@cooperpower.com & dhm3@pge.com
Meeting Time: October 16, 2007 Time: 8:00 AM
Attendance: 40 Total
21 Members
19 Guests

1. General:
    a. The minutes from the March 13, 2007 meeting in Hilton Dallas Lincoln Centre located in Dallas Texas were approved as submitted.
    b. A request was made for disclosure of any patents that may be related to the work of the WG, and there were no responses to the request for disclosure.
2. Significant Activities:
    a. **C57.12.31 Standard for Pole-Mounted** Equipment – Enclosure Integrity, Draft 1.1
        i. 4.3.2 Discussed adding "or every two years" to the requirements for running the coating tests.
        ii. 4.3.4 Discussed changing the delta E Hunter value from four to two.
        iii. 4.5.4 Added ASTM reference to cracking, and changed "crazing" to "checking" and added an ASTM reference to checking.

iv. 4.5.6 Discussed "exterior and interior" ended up removing the reference and just making it generic as it is mostly just applicable to exterior
v. Annex A – 4.a.2 Corrected freezer time from 15 minutes to 30 minutes

b. C57.12.30 Standard for Pole-Mounted Equipment - Enclosure Integrity for Coastal Environments, Draft 1.1

i. old 3.5 – enclosure security - deleted
ii. 3.5 – Discussed "gel coat" and left it in for other base materials
iii. 3.6 – left open adding other materials
iv. 4.1.2 – Need to add item about galling in this area
v. 4.2.3 – discussed – no changes
vi. 4.3.1 – changed to eliminate the "exterior or interior"
vii. 4.3.2 – added "or every two years"
viii. 4.3.4 – change the delta E Hunter from four to two
ix. 4.5.1.1 – The LaQue corrosion site is no longer available – Bob is looking for alternatives
x. 4.5.1.2 – Dan to make the same as the .31
xi. 4.5.5 – Dan to make the same as the .31
xii. 4.5.7 – Gravelometer – Dan to get the impact test from .31 and group to discuss these two alternatives at the next meeting

c. **C57.12.32** – Is out for ballot as a recirculation

3. Standard Status
   a. C57.12.28 Standard for Pad-Mounted Equipment – Enclosure Integrity
   b. Status: 2005 Standard, published – September 30, 2005
   c. C57.12.29 Standard for Pad-Mounted Equipment – Enclosure Integrity for Coastal Environments
   d. Status: 2005 Standard, published – November 10, 2005
   e. C57.12.31 Standard for Pole-Mounted Equipment – Enclosure Integrity
   f. Status: 2002 Standard – reaffirm or issue PAR before 2008
   g. C57.12.32 Standard for Submersible Equipment – Enclosure Integrity
   h. Status: 2002 Standard – reaffirm or issue PAR before 2008
4. Next Meeting:
5. The next meeting is scheduled for October 16, 2007 in Minneapolis, MN.
6. Adjournment:
   The meeting was adjourned at 9:00 AM.

10.2.2.4 C57.12.34 Three-Phase Padmounted Distribution Transformers

Ron Stahara & Steve Shull Co Chairs
rjstahara@msn.com & sshull@empiredistrict.com
PAR Status: Approved 3/20/2005
PAR expiration Date: 12-31-2009
Current Standard Date: Published March 8, 2005 (2004 date on document)
Current Draft Being Worked On: D2
Meeting Time: October 15, 2007 Time: 1:45 PM
Attendance: 42 Total
11 Members
31 Guests

5 Guests Requesting Memberships

Ron Stahara called the meeting to order, introductions were made, and an attendance roster was circulated. Ron reviewed the IEEE Patent Policy and asked the group if there were any patents that needed to be disclosed. None were announced to the group. The minutes were reviewed. It was discovered Brian Klaponski name was misspelled and Ali Ghafourian pointed out that he had made a comment concerning an issue on section 8.12. These corrections were made to the minutes. A motion by Brian Klaponski was made to accept the minutes as corrected and was seconded by Tommy Cooper. It was approved by acclamation.

Ron Stahara asked that the group review the document and have comments returned to Steve Shull by December so that they could be incorporated into the document. The group did a cursory look through the document and found a number of glaring mistakes that were reported and recorded by Steve Shull. There was some discussion on how the drawings would demonstrate that the bushing panel approach could illustrate both the primary or secondary side of a transformer. It was pointed out that the secondary side is numbered opposite to the primary side and there might be a confused interpretation as they are now shown. It was also pointed out the H0, X0, or H0/X0 bushing would need to be shown in these drawings as well. There was some discussion on this topic and a consensus was reached to place the H0 at two locations; In-line after the H3 bushing and directly below the H3 bushing possibly halfway between the bottom of the pad and the current bushing level or if on the secondary side, right before and in-line with the X1 bushing or directly below the X1 bushing again possibly halfway between the bottom of the pad and the current bushing level. Steve was asked to incorporate these concepts in some fashion in the drawings.

In reviewing Table 2, it was found that the current starting size was 45 kVA where as in other tables it was 75 kVA. A motion was made by Gael Kennedy to make 45 kVA the starting size in all tables where appropriate. This was seconded by Ken Hanus. This motion was carried by acclamation.

The concern that was raised by Ali Ghafourian during the last meeting on section 8.12 was discussed. There was a motion made by Dan Mulkey to change the wording to add the underlined word as shown below:

The minimum current-carrying capabilities of components for looped primary systems shall be 200 amperes <u>load break system</u> (continuous current rating)….

After some discussion it was agreed that the location of this addition was not appropriate and the motion was withdrawn. However, the real concern was the application of this standard for 600 ampere dead front designs. This would cause of the drawings clearance and configurations to change and possibly delay any balloting of the document to a much later time. It was pointed out by Al Traut that by changing the phrasing of section 8.7.2.3, the document could be limited to a 200 amp dead front design. This is illustrated below.

The <u>200 ampere</u> high-voltage connectors shall consist of either bushing wells and bushing inserts, or integral bushings, as specified.

A motion was made by Al Traut to change this as shown above. This was seconded by Ali Ghafourian. The motion was cared by acclamation.

A question was asked by Said Hachichi as to why the document was limited to 480 volts. He said that 600 volts was a common voltage used in Canada. It was pointed out by some that commercial wind farms and some ethanol plants had started to use this voltage. Ron Stahara said that early on in this document it was discussed and agreed to that it would be limited to 480 volts because at the time it was the prevailing voltage of the users. It was consensus of the group that this change was beyond this documents scope and that it should be considered in the next revision along with the 600 amp dead front designs.

Steve Shull said that he would make these corrections in the next draft and get this to each of the members to review for the comments due in December. With this, the meeting was adjourned.

10.2.2.5 C57.12.35 Bar Coding For Distribution Transformers
Lee Matthews & Giuseppe Termine Co Chairs
lmatthews@howard-ind.com & Giuesseppe.termine@peco-energy.com
PAR Status: APPROVED Dated: March 4, 2005
PAR expiration Date: December 31, 2009
Current Standard Date: 1996 (R2004)
Current Draft Being Worked On: Draft #7, Dated: 2007
Meeting Time: October 16, 2007, 3:15 PM
Attendance: 22 Total
15 Members
7 Guests

The meeting was called to order on October 16, 2007 at 3:15 p.m. in the Marquette/Lasalle Room of the Hilton Minneapolis Hotel in Minneapolis, Minnesota.

The meeting began with introductions of those in attendance.

The chairman asked if anyone was aware of any patents that might affect the development of this standard. No patent claims were made.

The minutes of the previous meeting in Dallas, Texas were reviewed and approved.

The remainder of the meeting consisted of the review of the status of the Draft D7-2007, dated April 9, 2007. This draft was submitted for balloting and it was approved with a 100% positive response. Several comments were received however, they were not required to be addressed as they were determined to be editorial comments by the IEEE. The document has been approved by REVCOM and has been submitted to the IEEE editors for publication.

The meeting was adjourned at 3:30 p.m.

10.2.2.6 C57.12.36 Distribution Substation Transformers
John Rossetti & David Aho - Co Chairs
jrossetti@mlgw.org & daho@cooperpower.com
PAR Status: PAR Approved June 2002
PAR expiration Date: December 2008

Current Standard Date: Approved at September 07 REVCOM
Did not meet

10.2.2.7 C57.15 Step-Voltage Regulators
Craig Colopy & Gael Kennedy Co Chairs
ccolopy@cooperpower.com & grkennedy@nppd.com
PAR Status: APPROVED Date: June 9, 2005
PAR Expiration Date: December 31, 2009
Current Standard Date: C57.15 – 1999 – Published April 2000
Current Draft Being Worked On: Draft 5.2 Dated: October 2005
Meeting Date: October 16, 2007, 1:45 pm
Attendance: 30 Total
30 Members
12 Guests
2 Guest Requesting Membership

1. Minutes of the Last Meeting 13 March 2007 Un-approved to Approved (moved Ken Hanus, 2nd by Lee Matthews , Passed with no objections)
2. IEEE Patent Policy conflict or infringements given to group – No responses or comments raised.
3. Draft 7 – is most current issue Draft 6 put into IEEE Template Document – short review of document transition to template
4. Normative References: IEEE and IEC documents after Craig gets the update completed he will send section to all the members to provide additional information and references. C57.12. reference used for hanger brackets, C37.90 and C37.92 Surge Withstand. The Chairman of the C37.90 Relay Standard noted that this standard already references the IEC surge testing; The IEC Standards referenced by some of the international utility company's specifications may need to be included.
5. Short Circuit Discussion relating to Section 5.8 – with special comments concerning the 25 times rated current, 2.26 times for the offset, with a note for example to use larger regulators, adding limiting reactors or other method for limiting the fault current above this. Removed the 40 times rated current section and placed a line on nameplate list (item w) to add symmetrical short circuit withstand ampere rating.

Action item: Finish soon – by the end of November send out to members and then have them returned by the end of December.

NEW DISCUSSIONS ON SUBJECTS:

Motion to place the rated shortcircuit withstand ampere rating on the Nameplate. This rating is a withstand which includes thermal and mechanical forces on/in the winding.

Motion was made to adjourn, 2nd, ed, and passed with no objection. Meeting over at 2:30PM Tuesday 16 October 2007.

10.2.2.8 C57.12.37 Electronic Reporting of Test Data (formerly P1388)
Richard Hollingsworth & Thomas Callsen Co Chairs
rhollin@howard-ind.com & Thomas.Callsen@ExelonCorp.com
PAR Status: Need to submit PAR for next revision
PAR Expiration Date: N/A
Current Standard Date: July 2005
Current Draft Being Worked On: N/A

Did not meet.

10.2.3 Subcommittee Old Business:
None reported

10.2.4 Subcommittee New Business:

The working group for C57.12.33 will be reactivated with Don Duckett and Al Traut co-chairing the document. The document will be updated with the final DOE ruling and sent out for comment before Charlotte.

Jerry Corkran reported to the subcommittee on several proposed changes in temperature rise test procedures in section 11 of C57.12.90. He also reported the Dielectric Test SC has established a task force to consider if Class I & II substation transformer test requirements should be combined.

Both are areas Distribution Subcommittee members should be aware of.

The meeting adjourned at 3:50 pm.