

## *PCS Working Group on General Requirements C57.12.00*

### **WG Item 82**

#### **C57.12.00 - 2000 Section 7.1.4.4 Stabilizing windings**

**Change Requested by :** V. Sankar 5/07/2005 & 10/23/2006

**Requested Change :** Request to form a task force to discuss the following on buried tertiary and to modify the clause of 7.1.4.4 of C57.12.00 based upon the recommendations of the task force :

- 1) Guidelines to determine MVA rating of buried tertiary.
- 2) To define the conditions under which this MVA is applicable ;
  - (i) is it when the HV or LV is delivering top MVA,
  - (ii) should transformer MVA be vectorial sum or arithmetic sum of buried TV MVA with HV or LV MVA,
  - (iii) is the above applicable for step-down operation or for step-up operation or for both.
- 3) Tests to prove buried TV MVA rating :
  - (i) what should be losses to determine mean oil and top oil rise,
  - (ii) is shut-down needed to determine TV winding gradient.

#### **Section 7.1.4.4 Stabilizing Windings**

Stabilizing windings in three-phase transformers (delta-connected windings with no external terminals) shall be capable of withstanding the current resulting from any of the system faults specified in 7.1.1, recognizing the system grounding conditions. An appropriate stabilizing winding kVA, voltage, and impedance shall be provided.

#### **WG Proposal :**

Chair Comment - This request would be a better fit in the section on “**Rating Data**”, possibly clause “**5.4.2.x Preferred Continuous Kilovolt ampere Ratings**”.

A Task force has been working on this issue since the Spring 2008 meeting, and this topic will be discussed within the Working Group at the Autumn 2009 meeting.

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**WG Item 85**

**C57.12.00 - 2006 Section 8 – Testing and Calculations**

**Change Requested by :** PCS Subcommittee meeting 3/19/2008.

**Requested Change :** Define requirements for a long term over-voltage excitation test.

**WG Discussion :**

- 1) What is the benefit desired of such a test ? Why do some customers ask for it in their specifications ?
- 2) Would this test tell something other tests do not ?
- 3) What class of products would it apply to ?
- 4) How much over voltage would be applied ?
- 5) How long would the over voltage be applied ?
- 6) What would the acceptance criteria be, is DGA sufficient ?
- 7) Are there valid DGA interpretations for such tests ?
- 8) Are other diagnostic measures needed ?

**WG Item 87**

**C57.12.00 -2002 Table 18 Short-circuit apparent power of the system to be used unless otherwise specified.**

**Change Requested by :** Pierre Riffon – 2006 Ballot Comment

**Requested Change :** Most of the values given are not realistic and are leading to unnecessary over designs. Except for very rare cases, the short-circuit current never exceeds 63 kA r.m.s. and this should be the ultimate standardized value. Specifying values which are higher than that lead to uneconomical designs.

**Section 7.1.5.3 System characteristics**

For Categories III and IV, the characteristics of the system on each set of terminals of the transformer (system fault capacity and the ratio of  $X_0/X_1$ ) should be specified. For terminals connected to rotating machines, the impedance of the connected equipment should be specified. In lieu of specified system fault capacities and rotating machine impedances, values shall be selected for each source from Table 18 and Table 19. In lieu of a specified  $X_0/X_1$  ratio, a value of 2.0\* shall be used. \*(Changed to 1.0 in 2008 Rev.)

**Table 18 - Short-circuit apparent power of the system to be used unless otherwise specified.**

Maximum system Voltage (kV)	System fault capacity	
	(kA rms)	(MVA)
Below 48.3	---	4300
48.3	54	4300
72.5	82	9800
121.0	126	25100
145.0	160	38200
169.0	100	27900
242.0	126	50200
362.0	84	50200
550.0	80	69300
800.0	80	97000

**WG Discussion :**

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### WG Item 88

#### C57.12.00 Table 10, Footnote 9, second paragraph

**Change Requested by :** Subhash Tuli – October 2009 Email

**Requested Change :** Please refer to the Nameplate Information in IEEE Std. C57.12.00 table # 10, footnote # 9, second paragraph. The presence and location of Current Transformer(s) when installed on the lower shank of the bushing under the cover is depicted with a circle and dot and termed as BCT, whereas when mounted on any segment or side of the transformer, it is shown with a sign such as “[ “ and line ending into it. These BCT’s identification is always identical in nameplate and schematic drawings.

“Situation, where current transformer(s) are not physically located under the lower shank of the bushing and instead it is supported on wood structure on the top yoke. How different it should be shown on the Nameplate and schematic diagrams?

My suggestion is to expand second paragraph of note # 9 and add a statement that “current transformers when not mounted in the lower shank of the bushing must be shown on the nameplate and the schematic drawings with a note that the CTs are located in the cleats & leads”.

**Table 10, Footnote 9 -** All winding terminations shall be identified on the nameplate or on the connection diagram. A schematic plan view shall be included, preferably indicating orientation by locating a fixed accessory such as the de-energized tap changer handle, the load tap changer, instruments, or other prominent items. All termination or connection points shall be permanently marked to agree with the schematic identification. In general, the schematic view should be arranged to show the low-voltage side at the bottom and the H, high-voltage terminal, at the top left. (This arrangement may be modified in particular cases, such as multiwinding transformers that are equipped with terminal locations that do not conform to the suggested arrangement.)

Indication of voltage transformers, potential devices, current transformers, winding temperature devices, etc., when used, shall be shown.

Any nonlinear device, capacitors, or resistors installed on the winding assembly or on any tap changer shall be indicated on the nameplate.

Polarity and location of current transformers shall be identified when used for metering, relaying, or line drop compensation. Polarity need not be shown when current transformers are used for winding temperature equipment or cooling control.

All internal leads and terminals not permanently connected shall be identified with numbers or letters in a manner that permits convenient reference will prevent confusion with terminal and polarity markings.

The scallop symbol shall be used in accordance with IEEE Std 315 and IEEE Std 315A for the development of windings.

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### **WG Item 89**

**C57.12.00/D2C – 9/2008 Sections 5.9, 7.4, 8.4, 8.7**

**Change Requested by :** Rick Marek – May 2009 Email

**Requested Change :** The term “reference temperature” appears eight times with five different definitions (in standard C57.12.00). The request is to define the two terms “Core Reference Temperature” and “Reference Temperature” in C57.12.80 and then modify the standards which refer to those definitions accordingly. For C57.12.00 it would be the sections cited above.

### **WG Discussion :**

The proposed change to C57.12.00 must be coordinated with the change to C57.12.80.