

Unapproved Meeting Minutes

*TF Tertiary Stabilizing Windings
Performance Characteristics Subcommittee
IEEE / PES Transformers Committee*

*October 31, 2011 8:00 AM
The Boston Renaissance Hotel
Boston, MA*

The Group met at 8:00 AM on Monday, October 31, 2011 with 17 members and 55 guests present. The current Working Group membership stands at 34 members (2 of them Corresponding Members), therefore we did have a quorum. Seven (7) guests requested membership:

Benjamin Lopez	Prolec GE
Doug McCullough	Maxima-Hyundai
Emilio Morales	EFACEC
John K. John	Virginia Transformer Corp.
Robert F. Tillman	Southern Co. Services
Stephen Anthony	PEPCO
Van Nhi Nguyen	Hydro Quebec

Next, an excerpt from the minutes of the Spring Meeting of WG “Continuous Revision of C57.12.00”, which included detailed report of our TF previous meeting, were reviewed by the Group and approved as representative of our previous activity.

Old Business

A. Survey on the new Clause for C57.12.00, related to thermal requirements for Stabilizing Windings.

The group has been working for three years to resolve the subject of default kVA rating for stabilizing windings. A new clause was prepared by the group for inclusion in C57.12.00, and the following text was surveyed among the Performance Characteristics and Insulation Life Subcommittees prior to this meeting.

“5.11.1.2 Thermal Rating for Stabilizing Windings (buried tertiary)

In addition to the short circuit duty (see 7.1.4.4), stabilizing windings shall be designed to withstand the transient and continuous thermal duty as specified by the user and in accordance with the allowable temperature limits of 5.11.1.

In the event no continuous thermal duty for the stabilizing winding can be established from the user’s specification, the manufacturer shall design the stabilizing winding considering the circulating current in that winding, resulting from a full single phase load in the largest main secondary winding. The manufacturer shall determine kVA rating for the stabilizing winding based on the transformer’s equivalent circuit for single phase loading condition.

The manufacturer shall calculate values of average and hottest-spot temperatures for the stabilizing winding to verify compliance with allowable temperatures. Initial conditions for these calculations shall be based on the transformer operating at its maximum continuous rating, before switching to the loading conditions described above in the first or second paragraph, whichever is applicable.”

Note: “Transformer” is a general term for two winding transformers and autotransformers

Forty (**40**) responses were received from the group surveyed, all of them “APPROVED”. Three of them included recommendations to further clarify the text. Based on those results, the work of this TF was deemed to be completed, and the new clause will be submitted for the next ballot of C57.12.00.

New Business

A. Formation of a new Working Group to develop an Application Guide for Tertiary and Stabilizing Windings

Based on the strong interest expressed by the participants, the Task Force has requested to be upgraded to a Working Group, specifically to develop an application guide for tertiary and stabilizing windings. A first draft for the Title, Scope and Purpose of this new document was previously discussed and submitted for review of the Committee Officers. During this meeting, further adjustments were made:

TITLE

“Guide for the application of tertiary and stabilizing windings in power transformers.”

SCOPE

Liquid immersed power transformers, as covered by C57.12.00. Main focus on wye-wye connected transformers and autotransformers, provided with delta connected windings.

PURPOSE

To provide users with a conceptual framework and recommendations for specification, application and performance evaluation of tertiary and stabilizing windings.

This guide will cover tertiary and stabilizing winding applications to Wind Farm Collector Transformers, Primary Distribution Transformers, and Network Tie Transformers and Autotransformers, with following remarks:

- We do not intend to address the general case of Multiwinding transformers; only the specific case of Y-Y connected transformers or autotransformers.
- Double primary, or double secondary Y-Y transformers are included within the Scope.
- An initial, critical question to solve is if a Stabilizing Winding (or Tertiary Winding for the same purpose) is required for an specific application of Y-Y

- connected transformers – Considering impact on, and user's needs of zero sequence performance.
- If a SW/TW is required, what parameters are recommended?

Expecting a positive response from the Administrative Committee, the Group made decision to start some preliminary work, and volunteers agreed to gather information on following subjects:

1. Survey on literature on Tertiary and Stabilizing Windings, identifying recommendations applicable to transformers within the scope.
2. Investigation on system requirements associated to Zero Sequence performance of transformers: Literature and Utility Practice
3. Investigation on impact of SWs and TWs regarding reported issues and transformers performance (zero sequence flux effects)

The meeting was adjourned at 9:10 AM.

Respectfully submitted,

Enrique Betancourt
Task Force Chair

Shourab Gosh
Acting Secretary