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09 May 2007

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Re: PC57.142 - Guide to Describe the Occurrence and Mitigation of Switching Transients Induced by Transformer, Switching Device, and System Interaction

Dear Bill:

I am pleased to inform you that on 07 May 2007 the IEEE-SA Standards Board approved the above referenced project until 31 December 2011. A copy of the file can be found on our website at <http://standards.ieee.org/board/nes/projects/C57-142.pdf>.

Now that your project has been approved, please forward a roster of participants involved in the development of this project. This request is in accordance with the IEEE-SA Operations Manual, Clause 5.1.2i under Duties of the Sponsor which states:

"Submit annually to the IEEE Standards Department an electronic roster of individuals participating on standards projects"

For your convenience, an Excel spreadsheet for your use has been posted on our website at <http://standards.ieee.org/guides/par/roster.xls>. Please forward this list to me via e-mail at [s.hampton@ieee.org](mailto:s.hampton@ieee.org) no later than 05 August 2007.

Please visit our website, IEEE Standards Development Online (<http://standards.ieee.org/resources/development/index.html>), for tools, forms and training to assist you in the standards development process. Also, we strongly recommend that a copy of your draft be sent to this office for review prior to the final vote by the working group to allow for a quick review by editorial staff before sponsor balloting begins.

If you should have any further questions, please contact me at +1 732 562 6003 or by email at [s.hampton@ieee.org](mailto:s.hampton@ieee.org).

Sincerely,

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**PAR Request Date:** 22 February 2007**PAR Approval Date:** 07 May 2007**PAR Signature Page on File:** Yes**Type of PAR:** New IEEE Standard**Status:** PAR for a New IEEE Standard**Root Project:****1.1 Project No.:** **C57.142****1.2 Type of Document:** Guide**1.3 Life Cycle:** Full-Use**1.4 Is this document in ballot now?** No**2.1 Title**

Guide to Describe the Occurrence and Mitigation of Switching Transients Induced by Transformer, Switching Device, and System Interaction

**3.1 Working Group Name** [Performance Characteristics - Mitigation of Switching Transients CB/Xfrmr Interaction Working Group](#)**Working Group Chair**[Degeneff, Robert C](#)

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**Working Group Vice Chair****3.2 Sponsor**[IEEE Power Engineering Society Transformers \(PE/TR\)](#)**Sponsor Chair**[Fallon, Don J](#)

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**Name of Standards Liaison Representative (if applicable)**[Chiu, Bill](#)

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**3.3 Joint Sponsor**[IEEE Power Engineering Society Switchgear \(PE/SWG\)](#)[Burse, Ted](#)

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**4.1 Type of Ballot:** Individual**4.2 Expected Date of Submission for Initial Sponsor Ballot:** December 2007**4.3 Projected Completion Date for Submittal to RevCom:** June 2008**5.1 Approximate number of people expected to work on this project:** 150

**5.2 Scope:** This Guide addresses the application of transformers in the presence of oscillatory switching transients. These oscillatory transients are typically produced by the interaction of the switching device, transformer, load, and system. This Guide defines operating conditions that may produce switching voltages damaging to the transformer insulation system. It discusses the electrical characteristics of the system source, switching device, transformer, and load and the nature of their transient interaction. It outlines several mitigation methods. Two examples are included. This Guide recognizes that many devices and/or system operations can produce the oscillatory transient waveforms addressed in this guide. The focus of this Guide is on the interaction between a transformer, system, and switching device as a result of several reports of transformer internal winding failures. This Guide does not cover semiconductor switching devices.

**5.3 Is the completion of this document contingent upon the completion of another document?** No

**5.4 Purpose:** When a transformer is switched into or out of a system, the transient voltage produced at the terminals of the transformer may contain several high frequency oscillatory components. When this oscillatory transformer terminal voltage has a frequency component near one of the natural frequencies of the transformer and is of sufficient magnitude and duration, permanent damage to the transformer internal insulation structure may result. The purpose of this Guide is to provide aid in the recognition of conditions and applications where transformers are subjected to terminal oscillatory switching transients that may produce internal winding voltages damaging to their internal insulation structure. This is accomplished by developing necessary expressions that characterize this interaction. This guide also characterizes the transformer, switching device, system, and load during this type of event. Many of the parameters that influence this system is be presented, to assist the user in developing an understanding when a potential concern exists. Finally, several mitigation methods are outlined.

**5.5 Need for the Project:** The conditions causing the event are of considerable practical interest because the transformers that have failed had passed all standard induced, high potential, and impulse voltage tests required in transformer standards. Additionally, these transformers were further protected with surge arresters. The purpose of this Guide is to provide aid in the recognition of conditions and applications where transformers are subjected to terminal oscillatory switching transients that may produce internal winding voltages damaging to their internal insulation structure.

**5.6 Stakeholders for the Standard:** Transformer and switchgear manufactures and purchasers will use and benefit from this guide. This Guide will be jointly sponsored by the PE Transformers Committee and the Switchgear Committee. The Transformer Committee will take the administrative lead in writing the guide.

**6.1.a. Has the IEEE-SA policy on intellectual property been presented to those responsible for preparing/submitting this PAR prior to the PAR submittal to the IEEE-SA Standards Board?** Yes **Presented Date:** 2006-10-20

If no, please explain:

**6.1.b. Is the Sponsor aware of any copyright permissions needed for this project?** No

If yes, please explain:

**6.1.c. Is the Sponsor aware of possible registration activity related to this project?** No

If yes, please explain:

**7.1 Are there other standards or projects with a similar scope?** No

If yes, please explain:

**Sponsor Organization:**

**Project/Standard Number:**

**Project/Standard Date:** 0000-00-00

**Project/Standard Title:**

**7.2 Is there potential for this standard (in part or in whole) to be adopted by another national, regional, or international organization?** ? Do not know at this time

**Technical Committee Name and Number:**

**Contact person:**

**Contact person Phone Number:**

**Contact person Email Address:**

**7.3 Will this project result in any health, safety, security, or environmental guidance that affects or applies to human health or safety?** No

**7.4 Additional Explanatory Notes:**

Previously approved PAR, sponsored by Transformer Committee, was approved in Dec, 2000, and was allowed to expire in 2006.

**8.1 Sponsor Information:**

Is the Scope of this project within the approved scope/definition of the Sponsor's Charter? Yes

If no, please explain: