

IEEE / PES Transformers Committee
Performance Characteristics Subcommittee

**WG to Investigate the Interaction between Substation Transients
And Transformers in HV and EHV Applications and Revision of C57.142**

Kansas City, MO
Tuesday, October 24, 2023
11:00 AM – 12:15 PM CDT – USA
Century C (Ballroom Level)

Chairman – Jim McBride
Vice Chair – Xose Lopez-Fernandez
Secretary – Tom Melle

- 1) Welcome and Chair's Remarks
- 2) Circulation of Attendance Sheets
 - Member count as indicated by signed attendance roster was 26 with 48 members required for quorum; therefore, quorum was achieved. 77 Guests were present (14 of which requested Membership). Total Attendance was 103.
- 3) IEEE Patent Policy Slides presented. There were no conflicts or patent claims.
- 4) Presentation and approval of meeting Agenda (motion by Waldemar Ziomek / second by Phil Hopkinson) and Minutes from Last Meeting (motion by Phil Hopkinson / seconded by Bertrand Poulin) – approved without opposition.
- 5) C57.142 Ballot and Comment Resolution – Jim McBride: Summary of the status of open comments before the ballot resolution group as follows:

Total Comments - 305

Comments Incorporated - 282

Remaining Comments to Address – 23

All Figures – Completed and Included thanks to Dr. Xose Lopez-Fernandez

All of the latest BRG documents will be posted on WG website.

- 6) Update on Switchgear Liaison TF - No Task Force meeting held as the Document is in Ballot Resolution.
- 7) Mitigation Methods Task Force Update – Jim McBride / Phil Hopkinson:

Chair commended Pierre Riffon for his contributions and presented seven possible mitigation methods including Resistor-Capacitor Snubbers and Online Monitoring among others.

- 8) New Business

STLI modeling and testing. The chair discussed (but did not show) the following paper:

IEEE Transactions on Power Delivery, Vol. 11, No. 1, January 1996
INVESTIGATIONS OF AN EHV AUTOTRANSFORMER TESTED WITH
OPEN AND ARRESTER TERMINATED TERMINALS.

The paper features an example of a 500 MVA, 765-345-34.5 kV single phase autotransformer used for modeling and testing. In summary, the STLI test introduced higher voltages to ground in the lower 80 % of the HW windings and even a failure.

The Chair introduced comments on the subject from Loren Wagenaar from recent emails. Bertrand Poulin and Phil Hopkinson personally delivered their own comments. The Chair presented comments from research by Jin Sim on STLI testing as well. Dharam Vir commented that in the past modeling was

not possible, but modern software can model and predict stresses of a simulated STLI test. Note: the content of most of the comments are contained in the meeting presentation slides.

Open discussion of possible additional mitigation methods:

Ajith Varghese asked whether there is any database with US grid failures due to transients. The Chair mentioned a CIGRE A2 study containing examples of worldwide interactions involving Switching Transients. That paper will be referenced and listed in the future.

Phil Hopkinson and the Chair discussed the feasibility of factory testing with special impulse tests, since the studied transformers that passed standard factory tests still failed under certain switching conditions. It was generally agreed that special impulse tests, including steep-front impulse testing could be beneficial for certain special-use cases (for example instrument transformers).

Discussion ensued about a tutorial, panel session, presentation and/or possibly a paper on the mitigation methods during an upcoming meeting. A motion was made by Hemchandra Shertukde / seconded by Bertrand Poulin to move ahead with a group presentation. The motion was approved with no opposition.

- 9) Next Meeting (Vancouver, BC Canada March 10th – 14th, 2024)
- 10) Motion to Adjourn at 12:15 PM CDT made by Waldemar Ziomek / seconded by Phil Hopkinson with no opposition.

MEETING ATTENDANCE (*Members only. Total attendance will be completed and provided via spreadsheet*):

<u>Role</u>	<u>Last Name</u>	<u>First Name</u>	<u>Company</u>
Chair	McBride	James	JMX High Voltage
Vice-Chair	Lopez-Fernandez	Xose	Universidade de Vigo
Secretary	Melle	Thomas	HIGHVOLT
Member	Britton	Jeffrey	Phenix Technologies
Member	Caverly	David	Trench Limited
Member	Garcia Wild	Eduardo	Siemens Energy
Member	Heiden	Kyle	EATON Corporation
Member	Hopkinson	Philip	HVOLT Inc.
Member	John	John	Virginia Transformer Corp.
Member	Joshi	Akash	Black & Veatch
Member	Kirchenmayer	Egon	Siemens Energy
Member	Lee	Moonhee	Hammond Power Sol
Member	Li	Weijun	Braintree Electric Light Dept.
Member	Montanha	Juliano	Siemens Energy
Member	Pepe	Harry	Phenix Technologies
Member	Pointner	Klaus	Trench Austria GmbH
Member	Poulin	Bertrand	Hitachi Energy
Member	Roussell	Marnie	Entergy
Member	Sarkar	Amitabh	Virginia Transformer Corp.
Member	Sen	Cihangir	Duke Energy
Member	Sharp	Michael	Trench Limited
Member	Spurlock	Mike	Spurlock Engineering Services, LLC
Member	Varghese	Ajith	Prolec-GE Waukesha
Member	Verdolin	Rogério	Verdolin Solutions
Member	Vir	Dharam	Prolec-GE Waukesha
Member	Ziomek	Waldemar	PTI Transformers