

MEETING MINUTES (Unapproved)
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**

Vancouver, BC Canada
Tuesday March 12th, 2024
11:00 AM – 12:15 PM PDT
Balmoral (Level 3)

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 33 of 50 members; therefore, quorum was achieved. 60 Guests were present, 7 of which requested Membership. Total Attendance was 93. (Note: the room size was not sufficient for all Members and Guests)
- 3) IEEE Patent Policy Slides presented. There were no conflicts or patent claims.
- 4) Presentation and approval of meeting Agenda (motion by John John / second by Phil Hopkinson) and Minutes from Fall 2023 Meeting (motion by Amitabh Sarkar / seconded by Egon Kirchenmayer) – approved without opposition.
- 5) C57.142 Ballot and Comment Resolution – Jim McBride: The Chair presented a summary of the status of open comments before the ballot resolution group as follows:

Total Comments - 305

Comments Incorporated - 285

Remaining Comments to Address – 20

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

The latest BRG document and link to the IEEE transactions paper

(<https://ieeexplore.ieee.org/document/9161400>) are posted on WG website.

- 6) Update on Switchgear Liaison TF - No Task Force meeting held as the Document is in Ballot Resolution. Dave Caverly could not be present at this meeting.

- 7) Mitigation Methods Task Force Update – Jim McBride / Phil Hopkinson:

Chair requested the TF meet remotely as soon as next week. An invitation will be sent out in the coming days.

- 8) New Business

The chair discussed the submission of statements by Bertrand Poulin regarding transformer **protection by use of internal surge arrestors** in Section 7.5.

A motion was made by Bertrand Poulin / seconded by Phil Hopkinson to include the submitted paragraph in the Guide.

Discussion followed: Phil Hopkinson stated that series resonances are most damaging to the windings. Bertrand Poulin stated that “everything magnetically couples to everything” inside of a transformer. The WG by and large agreed with these points. Egon Kirchenmayer suggested deleting the phrase “*prevents the excitation of natural frequencies*”, as this mitigation only dampens the voltage. Phil Hopkinson agreed this mitigation absorbs energy and provides damping; therefore, a motion was made by Jeffrey Britton / second by Ajith Varghese that the phrase “*reduces the amplitude of natural*

frequency oscillations” be adapted. There was no opposition to the motion to include the amended statement and the motion carried without opposition.

The Chair presented prior comments from research by Jin Sim on STLI testing. Dharam Vir made a presentation and commented that in the past modeling was not possible, but modern software can model and predict stresses of a simulated STLI test. The content OF Dharam Vir’s presentation will be included within the meeting slides and posted to the WG website.

Phil Hopkinson commented per (Loren Wagenaar) that for 765kV BIL steep-front / long tail should still be considered. Bertrand Poulin agreed with the conclusions of the presentation. Christopher Johnson commented that certainly different models could yield different results and each manufacturer must determine the need for STLI testing independently.

Open discussion of possible mitigation methods summary:

Chair suggested tutorial panel at upcoming TC meeting and a possible technical report or IEEE transactions paper.

Per the last meeting, the WG will move ahead with a group presentation for a future tutorial. Phil Hopkinson suggested eventually incorporating the potential technical report into perhaps an annex of a future version of C57.142. Joe Watson suggested as we move forward we allow the Dielectric Subcommittee to decide if a new TF should be formed to pass on the WG recommendations to the appropriate standards groups.

- 9) Presentation by Phil Hopkinson – Switching Mitigation Concepts. Will be posted on the WG website
- 10) Next Meeting – Fall 2024 in St. Louis, MO
- 11) Motion to Adjourn at 12:17 PM CDT made by JC Hernandez / seconded by Jeffery Britton with no opposition.

MEETING ATTENDANCE (PENDING)

Role	Last Name	First Name	Company
Chair	McBride	James	JMX High Voltage
Vice-Chair	Lopez-Fernandez	Xose	Universidade de Vigo
Secretary	Melle	Thomas	HIGHVOLT
Member	Betancourt	Enrique	Prolec GE
Member	Boettger	William	Boettger Transformer Consulting
Member	Britton	Jeffrey	Phenix Technologies, Inc.
Member	Caverly	David	Trench Limited
Member	Garcia Wild	Eduardo	Siemens Energy
Member	Hopkinson	Philip	HVOLT Inc.
Member	John	John	Virginia Transformer Corp.
Member	Kirchenmayer	Egon	Siemens Energy
Member	Lee	Moonhee	Hammond Power Solutions
Member	Li	Weijun	Braintree Electric Light Dept.
Member	Montanha	Juliano	Siemens Energy
Member	Pepe	Harry	Phenix Technologies, Inc.
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
Member	Varghese	Ajith	SPX Transformer Solutions, Inc.
Member	Verdolin	Rogério	Verdolin Solutions Inc.
Member	Vir	Dharam	Prolec-GE Waukesha
Member	Ziomek	Waldemar	PTI Transformers
Guest	Allison	Robert	Dominion Energy
Guest	Benach	Jeff	Megger
Guest	Bhatt	Vivek	Prolec-GE Waukesha
Guest	Bojan	Popovic	KPT
Guest	Bracum	Robert	KPT
Guest	Casallas	Camilo	Trench LTD
Guest	Digby	Scott	Duke Energy
Guest	Dolloff	Paul	EKPC
Guest	Dorpmanns	Luc	SMIT Transformatoren B.V.
Guest	Espindola	Marco	Hitachi Energy

Role	Last Name	First Name	Company
Guest	Fitzgerald	Sean	ComEd
Guest	Frazier	Raymond	Ameren
Guest	Gamboa	Jose	H-J Family of Companies
Guest	Gara	Lorne	Shermco
Guest	Garcia	Miguel	Hitachi Energy
Guest	Hakim	Shamaun	WEG Transformers USA Inc.
Guest	Hernandez	JC	Georgia Tech - NEETRAC
Guest	Hernandez	Giovanni	Virginia Transformrer Corp.
Guest	Hoffman	Saramma	PPL Electric Utilities
Guest	Holifield	Thomas	Howard Industries
Guest	Hossain	Saif	Trench Limited
Guest	Howell	Logan	Hitachi Energy
Guest	Johnson	Christopher	Oncor
Guest	Katz	Nathan	Pacific Corp
Guest	Kennedy	Gael	GR Kennedy & Associates LLC
Guest	Kessler	Stacey	Ulteig Engineers
Guest	Khan	Qasim	Georgia Tech - NEETRAC
Guest	King	Gary	Howard Industries
Guest	Kiparizoski	Zan	Howard Industries
Guest	Leal	Fernando	Prolec GE
Guest	Lee	Junho	Hyundai Electric
Guest	Mani	Kumar	Duke Energy
Guest	Martinez	Alberto	WEG
Guest	McBride	Joseph	JMX High Voltage
Guest	Mikulecky	Filip	Siemens Energy
Guest	Munoz	Marta	Hitachi Energy
Guest	Naranjo	Volney	Megger
Guest	Natale	Anthony	HICO America
Guest	Nims	Joe	Allen & Hoshall, Inc.
Guest	Orr	Paul	NEMA
Guest	Pandza	Tihomir	Siemens Energy
Guest	Parkinson	Dwight	EATON Corporation
Guest	Partyka	George	PTI Transformers
Guest	Patel	Nitesh	Hyundai Power Transformers USA
Guest	Patel	Sanjay	SMIT Transformer Sales, Inc.
Guest	Pidcock	Jay	Ameren
Guest	Ploetner	Christoph	Siemens Energy
Guest	Prince	Jarrold	ERMCO
Guest	Radbrandt	Ulf	Hitachi Energy
Guest	Radu	Ion	Hitachi Energy
Guest	Raymond	Tim	EPRI
Guest	Reimer	Jonathan	Fortis BC

Role	Last Name	First Name	Company
Guest	Reyes Perez	Juan	Hitachi Energy
Guest	Richardson	Michael	Ameren
Guest	Rocque	Tim	Prolec GE Waukesha
Guest	Ronchi	Rodrigo	WEG-Voltran
Guest	Schleismann	Eric	Southern Company Services
Guest	Schrammel	Alfons	Siemens Energy
Guest	Sethi	Kabir	Hitachi Energy
Guest	Sharifi	Masoud	Siemens Gamesa Renewable
Guest	Sharpless	Samuel	Rimkus Consulting Group
Guest	Shertukde	Hemchandra	University of Hartford
Guest	Shull	Stephen	BBC Electrical Service, Inc.
Guest	Singh	Kushal	ComEd
Guest	Stacy	Fabian	Hitachi Energy
Guest	Steele	Hampton	Tennessee Valley Authority
Guest	Steineman	Andrew	Delta Star Inc.
Guest	Tabakovic	Dragan	Hubbell Power Systems
Guest	Tolcachir	Eduardo	TTE
Guest	Vermette	Yves	Electro Composites ULC
Guest	Vijayan	Krishnamurthy	PTI Transformers
Guest	Watson	Joe	JD Watson & Associates
Guest	Weatherbee	Eric	PCORE Electric
Guest	Weisensee	Matthew	PacifiCorp
Guest	Wong	Terry	Trench LTD
Guest	Yun	Joshua	Virginia Transformer Corp.
Guest	Zhang	Shibao	PCORE Electric