Introduction

Reliable harmonic studies have become increasingly important for transmission system operators. Evaluating the impact of new inverter based resources connections, the increasing effect of cabeling on harmonic impedance (resonances), and harmonic disturbance levels are just some examples. An essential basis for such studies is a reliable frequency-dependent network model with all elements modeled in sufficiently high detail.

One of the challenges is the realistic representation of frequency-dependent impedance of networks and customers connected downstream to the transmission system. This particular aspect is addressed in a collaborative project between King's College London and Technische Universität Dresden by comparing the current practice and state of the art in the UK and Germany. Results and findings shall contribute to the improvement of harmonic studies in both countries.

This workshop is organized in the framework of the TransCampus programme and shall provide a platform for experts in the area of harmonic analysis in transmission systems to share results from recent projects and to discuss future needs and challenges on this topic.

TransCampus Project Group

Program

Wednesday, 8th November

12:00 *Registration, coffee and snacks*

12:30 *Welcome and workshop motivation*

Peter Schegner (Head of Institute), Jan Meyer, Technische Universität Dresden (DE)

12:45 *Invited speaker session 1*

Importance of network harmonic impedance in the context of IEC standardization
Mark Halpin, Auburn University (US) (Chairman IEC SC77A)

Experiences in modelling aggregated harmonic impedance of downstream networks and customers
Gu Ye, TenneT TSO (NL)

Impact of increased cabling on harmonic resonances in transmission systems
Lutz Hofmann, Leibniz Universität Hannover (DE)

Discussion

14:15 *Coffee break*

14:45 *TransCampus session 1*

Impact of modelling downstream HV networks on harmonic impedance in transmission systems
Stephan Scholtz, Technische Universität Dresden (DE)

The role of capacitance in load model and system model
Omowumi Grace Olasunkanmi, Swansea University (UK)

Determination of equivalent circuit models for the aggregated representation of downstream HV networks
Max Domagk, Technische Universität Dresden (DE)

Discussion

16:15 *Laboratory visit*

18:00 *Evening Event*

Meeting Point:
Frauenkirche
Neumarkt
01067 Dresden

Kolossos, 2013

We discover together the hidden gems of Dresden's city center on an historic walking tour (1.5 hours) with his Majesty Augustus the Strong and his wife Countess Cosel, followed by a dinner in a lovely restaurant.

Host

TUD Dresden University of Technology
Institute of Electrical Power Systems and High Voltage Engineering
Chair of Electric Power Supply

Thursday, 9th November

09:00 *Invited speaker session 2*

Software tool for converter stability assessment in frequency domain
Diptargha Chakravorty, TNEI Services (UK)

Harmonic impedance characteristics of the German transmission system
Marco Lindner, TransnetBW GmbH (DE)

US experience in modeling transmission systems for harmonic analysis
Gaurav Singh, EPRI (US)

Discussion

10:30 *Coffee break*

11:00 *TransCampus session 2*

Challenges in modelling inverter based resources for harmonic studies – Status of CIGRE working group C4.65
Grazia Todeschini, King's College London (UK)

Impact of passive filter placement on the harmonic impedance in transmission systems
Ana-Maria Blanco, Technische Universität Dresden (DE)

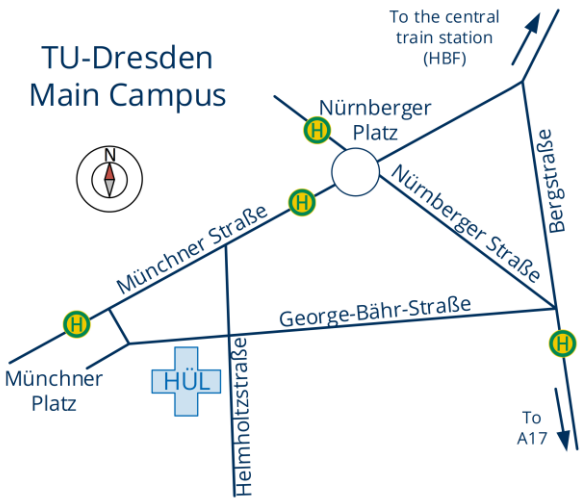
11:45 *Perspectives and future needs*

Panel discussion

12:30 *Get together, coffee and snacks*

13:30 *End of the workshop*

Location



Ballroom of the Faculty of Business and Economics
Hülße Building (HÜL), Nord wing, 3rd floor
Helmholtzstraße 10
01062 Dresden
TU-Dresden – Main campus
Germany

Registration

The participation in the workshop and evening event is free, but prior registration is required. The number of participants is limited (first come, first served). Registration deadline: 15th October, 2023.

Please send an E-mail to Ana-Maria Blanco with your personal information and dietary restrictions.

✉ ana.blanco@tu-dresden.de

If you need more information, please do not hesitate to contact us via E-mail or the following phone number:

✆ +49 351 463-32482

TECHNISCHE UNIVERSITÄT DRESDEN

KING'S College LONDON

Academia-industry workshop

Challenges of harmonic studies in modern transmission systems

Dresden
8th and 9th November 2023

transCampus