6th International Workshop on Grid Simulator Testing of Wind Turbine Power Trains and Other Renewable Technologies

We are inviting you to participate at the 6th International Workshop on Grid Simulator Testing of Energy Systems and Wind Turbine Drivetrains. The 6th workshop will take place at NREL campus **in Golden, CO** during **Nov 9-10, 2022**.

The previous workshop was hosted by FSU CAPS in Tallahassee, FL in November 2018: https://www.nrel.gov/grid/workshop-grid-simulator-2018-proceedings.html

Since then, we had a long gap in workshop series due to pandemic (2020 workshop was canceled).

Just to remind you that this workshop was established in 2013 by NREL, Clemson University and FSU CAPS to serve as a venue for discussing the research and testing needs, state-of-the-art apparatuses and methods involved in grid integration testing of renewable energy generation, energy storage and other enabling technologies. Previous workshops featured presentations from industry representatives and grid simulator facility experts on how a broad range of design, development, and testing capabilities around the world can play a pivotal role in securing reliable integration of wind and solar generation, energy storage, and other technologies into power grid in transition. More detailed information on all previous workshops can be found here: https://www.nrel.gov/grid/simulation-phil.html

The topic areas of interests for 6th workshop include:

- Grid simulator projects: new developments, updates, challenges, and results
- Field experience from various teams around the world
- Power hardware-in-the-loop (PHIL) grid integration testing for wind turbines, PV and energy storage systems, fuel cells and electrolyzers, marine hydrokinetic generation, other renewables, control systems, etc.
- Impedance characterization testing
- Testing of hybrid power systems, microgrids and island grids, grid forming inverters, DC grids
- Emerging challenges of grid simulation, potential for further standardization of testing methods

Agenda

November 9 – Day 1	
8:15am	Registration, Breakfast, Introductions
8:45am – 9:15am	**Session 1 – Updates from organizing institutions** • Introductions • Update on NREL Research - V. Gevorgian, NREL, USA • Laboratory Updates and Projects - G. Ozkan, Clemson University, USA • Update on FSU-CAPS - M. Steurer, FSU, USA
9:15am – 10:45am	**Session 2 – Grid simulator testing of wind turbine drive trains** • Grid Integration Research and Projects at Fraunhofer IWES, results of project Hil-GridCop - G. Quistorf, Fraunhofer IWES, Germany • LORC update and projects experiences - L. Rasmussen, LORC, Denmark • GE Type 3 GFM wind turbine - A. Tiwari, GE • Virtual electric machine: Inertia emulation in ABB's ACS6080 Grid Simulator in special applications - G. Chekavskyy, ABB, Poland
10:45am-11am	Coffee Break
11am – 12pm	**Session 3 – Grid Simulator Platforms and Experiences** • NREL CGI and PHIL Platform for Validation of Multi-Technology Energy Systems at Scale - P. Koralewicz, NREL, USA • KINECTRICS grid simulator - D. Murray, KINECTRICS, Canada • Grid Simulator Platforms and Experiences) Voltage and current control of Power Electronics AC and DC Grid Simulators - P. Sobanski, ABB, Poland • Grid simulator project experience and overview of market needs, J. Otinero & J. Lee, IDOM, Spain
12pm – 1:15pm	**Lunch**
1:15pm – 2:30pm	**Session 4 – Advanced Testing using Grid Simulators** • Impedance characterization of grid following and forming resources using CGI - S. Shah, NREL, USA • New 15kV class SiC based amplifier from TECO Westinghouse (capability, characterization, etc.) – M. Bosworth, FSU CAPS, USA • Progress on tests for validation of harmonic models in EU PROMOTioN project - P. Sorensen, DTU, Denmark • Advanced Testing using Grid Simulators) Determining DUT Thevenin Equivalent Model (Part of IEC61400-21-4) – J. Eckerle, ABB, Switzerland
2:30pm-3:30pm	**Session 5 – PHIL Testing of Articles using Grid Simulators** • A Power Hardware-in-the-Loop (PHIL) Test Bed for Inverter Testing in Southern California Edison (SCE) - Md Arifujjaman, SCE, USA • PHIL validation of ultracapacitor storage for black-start application - S. Alam, INL, USA
3:30pm – 3:45pm	Coffee break
3:45pm – 4:45pm	**Session 6 – Grid Simulators for Models and Standards Validation** • PEGI platform overview - B. Mather, NREL, USA • Update on IEEE P2004 working group activities - M. Steurer, FSU, USA • Potential Methods for Large Scale Inverter Commissioning Sag Testing" - M. Stephens, EPRI, USA
4:45pm – 5pm	**Day 1 closing remarks and discussions**
7pm	No host dinner, Yard House – 14500 West Colfax Avenue, Suite 341, Lakewood, CO 80401

November 10 – Day 2	
8:00am	Breakfast
8:30am – 9:30am	**Session 7 – PHIL/CHIL Testing for Small Microgrids and Islands** • Power Hardware-in-the-Loop Evaluation for the Borrego Springs Microgrid SETO Project - A. Pratt & K. Prabakar, NREL, USA • CHIL plug & PHIL testing of the NREL converter, FSU CAPS, USA • PHIL testing of a PV Peaker Plant in island power grid, islanded distribution systems - A. Hoke, NREL, USA
9:30am – 10:45am	**Session 8 – Fidelity of PHIL Interface** • Update on HQ PHIL system - R. Gagnon, HydroQuebec, Canada • GTSOC platform – C. Jegues, RTDS, Canada • Stability and fidelity of NREL PHIL interface - P. Koralewicz, NREL, USA
10:45am - 11am	Coffee Break
11:00 – 12:45pm	**Session 9 – Grid simulators: Looking Forward** • Advanced control of the power amplifier - D. Rimorov, HydroQuebec, Canada • Development of 30 MW Testbench for Offshore Wind Turbines - G. Ozkan, Clemson, USA • PQ4Wind project - T. Jersch, Fraunhofer IWES, Germany • High-performance computing and RT co-simulation of energy systems - R. Hovsapian, NREL, USA
12:45pm – 1:15pm	**Lunch**
1:15pm – 3:30pm	**Tour to NREL Flatirons Campus and demonstration of grid simulator** • Bus will be provided by NREL
3:30pm - 4pm	**Return to workshop venue**
4pm – 5 pm	**Final Discussions, Closing Remarks**
5pm	**Adjourn**