



# Grid of the Future™



November 11-14



QUANTA  
TECHNOLOGY

The **Grid of the Future Symposium**, sponsored by the CIGRE US National Committee (USNC), with the theme Technology for the 21st Century Electric Utility, will be held **November 11-14, 2024** in **Raleigh, NC**.

The Symposium, hosted by **Quanta Technology**, will be a forum for the participants to discuss state-of-the-art innovations in generation, transmission, distribution, and innovative smart grid technologies.

Grid of the Future 2024 will feature plenary sessions, technical paper sessions, and tutorials by international experts. With up to 100 papers presented, three keynote speakers, and four industry panels from industry leaders, attendees will gain invaluable insights. The symposium starts with a Next Generation Network (NGN) tutorial, "Signals and Implications," and also includes the NGN Paper Competition for young professionals, a gala dinner at the North Carolina Museum of Natural Sciences, and three optional tours. Additionally, connect with peers and experts at networking events for NGN and Women in Energy (WiE).

## The Symposium scope covers the following general topics:

- Active Distribution Systems and Distributed Energy Resources
- Enhancing Grid Resilience
- Grid Operation, Automation & Management
- Climate Change Adaptation
- Intelligent Protection and Controls
- Beneficial Electrification
- T&D Modeling, Sensors and Data Analytics

## Tours and Tutorials:

### North Carolina State University FREEDM Center Tour

**Date:** November 14, 2024 from 8:00am-12:00pm

**Description:** At the FREEDM Center, they're building the internet of energy: a network of distributed energy resources that intelligently manages power using secure communications and advanced power electronics. Their research priorities include power electronics packaging, controls theory, solid state transformers, fault isolation devices, and power systems simulation and demonstration.

### Addressing Integration Challenges of Voltage Source Converters (VSCs)

**Date:** November 14, 2024 from 8:00am-12:00pm

**Description:** This tutorial is intended for an audience with a general background in power systems working in transmission planning, operations, or protection and control. It will provide attendees with an introduction to reliable grid integration of Voltage Source Converters (VSCs), such as Inverter-Based Resources (IBRs), Flexible AC Transmission Systems (FACTS) and High-Voltage Direct Current (HVDC) Systems, within the context of the "Modern" power system. The tutorial will cover key concepts related to VSC electrical characteristics and control architecture (i.e., Grid-Following and Grid-Forming) as well as challenges related to planning and operation of power-systems with grid conditions or high-penetration of VSCs (i.e., impedance-based stability and electromagnetic transient modeling).

### Smart Wires Laboratory Tour

**Date:** November 14, 2024 from 8:30-11:30am

**Description:** Tour of grid enhancing technology provider, Smart Wires', global Research and Development, testing and validation laboratories located in the Research Triangle of North Carolina. The tour will cover an intro to Smart Wires' advanced power flow control technology (APFC), a tour of the lab itself (including our RTDS equipment, High Current Testing System, and Environmental Chamber), and light refreshments.

### Quanta Technology Value of Hardware-in-the-Loop (HIL) Testing

**Date:** November 14, 2024 from 10:00am-1:00pm

**Description:** The power industry is rapidly evolving with the integration of Inverter-Based Resources (IBRs) and new system loads such as electric vehicles and data centers. Protection and control equipment is also evolving to make the grid smarter and more reliable. New methodologies are required to ensure that protection and control philosophies continue to meet the requirements of the grid. Hardware-in-the-Loop (HIL) testing is a methodology that enables this evolution by allowing the simulation of real-world scenarios such as fault situations encountered in power systems as well as providing insights into system performance and reliability. This workshop will cover how HIL supports the integration of new technologies: 1) The impacts of IBRs on the transmission protection, and 2) The modernization of substations via IEC 61850. It will also include a tour of Quanta Technology's HIL lab.

## About CIGRE USNC:

With over 50 collective members, 14 university members, and 1,000 individual members, CIGRE USNC is a collaborative global community committed to the world's leading knowledge program for the creation and sharing of power system expertise.