1. Session Title

Towards Enhancing the Resiliency of Grid-Interactive Inverters

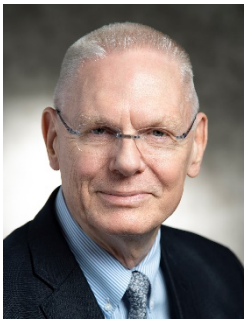
2. Abstract

Five experts from the industry, academia, DoE, and US national labs will give a joint panel on standards, transient performance, ancillary grid-support services, health monitoring, and resiliency of grid-interactive inverters. The panelists will present case studies and discuss their findings from industry projects, and DoE- and NSF-sponsored projects. The panelists will briefly present five topics to allow more time for discussions, dialogs, and Q&A in this session.

The energy infrastructure is rapidly changing as more sustainable energy resources such as photovoltaic arrays, wind turbines, and energy storage systems are distributed in the power grid as generation units. Moreover, distribution systems that are resilient to disruptive events, agile to the impetus of environmental changes, and employ a high penetration of sustainable energy resources will be the backbone of the future power grids, where inverters play the most significant role. Inverters also allow consumers to generate electricity from distributed energy resources when the utility power flow from the primary power plants is interrupted due to natural disasters, faults, and cyberattacks. Energy sectors are also moving toward developing advanced design and control schemes for future smart cities with interconnected smart buildings capable of working off-grid and are resilient to disruptive events. Therefore, new standards and designs for inverters to provide higher resiliency, flexibility, and reliability for modern power systems become critical.

3. Session Organizers

Behrooz Mirafzal is the Louie T. Marshall professor in the Department of Electrical and Computer engineering at Kansas State University. He has over 18 years of industrial and academic experience in power electronics applications in energy conversion systems and grid-interactive converters. He is the author or co-author of over 120 articles in professional journals and conferences. He is also the author of a textbook titled Power Electronics in Energy Conversion Systems, published by McGraw Hill in 2021. He received three IEEE Transactions paper awards in 2008, 2012, and 2020. He has been an AE for the Industry Applications Transactions since 2011 and the Power Electronics Transactions since 2018. He currently serves as the Secretary of the IAS RSECS Committee.



Bob Reedy joined the Systems Integration team of DOE SETO in January 2020--coming up from the University of Central Florida, where he served jointly as Associate Instructor in the ECE Department and Program Director for Grid Integration in the UCF Facilities Department. His involvement with solar energy began as Director of Systems Research at the Florida Solar Energy Center (FSEC) of UCF in early 2007. Bob earned his MSEE and BEE from Auburn University, following the power systems analysis track. He later received an MBA from Florida Southern College, with a focus on production economics. He is a Licensed Professional Engineer in Florida. Most recently, Bob has been heavily involved with

the control and protection of grid-interactive PV and storage, with particular attention to the enhancement of grid stability, reliability, and resiliency through utility control of advanced inverters.

4. Session Panelists/Speakers

Panelist 1: Robert Reedy, Technology Manager at BGS and Contractor to DOE - SETO
Title: *Beyond Current Standards – Anticipating Future Inverter-Based-Resources (IBR) Performance Needs*

Panelist 2: Behrooz Mirafzal, Professor, Kansas State University
Title: *Universal Inverter for Grid-following and Grid Forming Modes of Operation*

Panelist 3: Maozhong Gong, Principal Engineer, GE Research
Title: *Transient Performance Improvement for Commercial Grid Inverters - Real-Time Validation*

Panelist 4: Akanksha Singh, Senior Research Engineer, National Renewable Energy Laboratory
Title: *Resiliency and Grid-Support Services of Medium-Voltage Grid Converters*

Panelist 5: JiangBiao He, Assistant Professor, University of Kentucky
Title: *Online Health Monitoring of Abnormalities in Grid-Interactive Inverters*