

Call for Papers

Special Issue on “Control and Management of Electric Power Systems with High Shares of IBR”

Scope: The growing interest in the integration of variable renewable energy (VRE) and distributed energy resources (DER) on both policy and economic grounds is driving the transformation of electric power systems. The significant deployment of VRE and DER can effectively displace conventional synchronous generator-based power plants that for decades have been almost universally the main technology for power generation in electric power systems. Additionally, these inverter-based resources (IBR) introduce a high level of uncertainty and variability into the operation of electric power networks. This transformation raises a wide range of technical questions and operational challenges including voltage stability, frequency response, system synchronization, power electronics-driven stability, scheduling and mitigation of variability, system protection and coordination, etc. The optimal coordination of these resources requires a greater interoperability, significant upgrades of grid automation and the capabilities for real-time monitoring and adaptive actuation to be adopted by system operators.

This special issue serves as a forum to address some of these issues and, therefore, solicits original research papers that target at, but are not restricted to, the following topics:

- Novel analytical tools and methods for assessment of dynamics and stability of IBR dominated power systems
- Distributed and hierarchical control systems for bulk power systems with IBR
- Coordinated automation and management of active distribution and transmission systems
- Grid-forming inverters and their role in the operation of future power systems
- Modern paradigms and architectures for operation and control of bulk electric power systems considering DER and VRE (with a focus on the system of systems notion)
- Autonomous and intelligent operation and control in future power systems
- Advancements in Energy Management System (EMS), Advanced Distribution Management System (ADMS), Distributed Energy Resource Management System (DERMS), and Outage Management System (OMS) solutions

This special issue emphasizes collaborative research and is especially interested in papers stemming from collaborations between academia and industry. Submissions from industry are highly encouraged. We welcome papers that address technical issues for both the transmission and the distribution system.

Submission Guideline

Submitted articles must not have been previously published or currently submitted for publication elsewhere. All submissions are subject to the IEEE System Journal's peer-review procedures. The authors should follow the journal's Author Guide at <https://ieeesystemsjournal.org/author-instructions/>. Select the paper type "SI: Control of Power Systems with IBR" during the submission process to ensure that the article is considered for publication in this special issue.

Important Dates

Submission deadline for full papers and beginning of 1st review cycle: May 15th, 2022

End of 1st review cycle and notification to authors: August 31st, 2022

Revised paper submission and beginning of 2nd review cycle: October 31st, 2022

End of 2nd review cycle and final notification to authors: January 31st, 2023

Publication of Special Section (early access on IEEE Explore): March 2023 (tentative)

Guest Editors

Amirhossein Sajadi, Western Electricity Coordinating Council (WECC) and University of Colorado Boulder (CU Boulder)

Luka Strezoksi, University of Novi Sad and Schneider Electric

Bri-Mathias Hodge, University of Colorado Boulder (CU Boulder) and National Renewable Energy Laboratory (NREL)

Kenneth Loparo, Case Western Reserve University (CWRU)

Duncan Callaway, University of California, Berkeley (UC Berkeley) and the Lawrence Berkeley National Laboratory (LBNL)

Marc Carbone, National Aeronautics and Space Administration (NASA)

Alexandre Oudalov, Hitachi ABB Power Grids

Panagiotis Papadopoulos, University of Strathclyde

Milos Cvetkovic, Delft University of Technology (TU Delft)

Murali Baggu, National Renewable Energy Laboratory (NREL)