



2025 IEEE 4th International Conference

on

# Smart Technologies for Power, Energy and Control (STPEC 2025)

December 10-13, 2025

Department of Electrical and Electronics Engineering,  
National Institute of Technology Goa, Goa, India



## Special Session 20 (SS20)

### Synergistic Control and Energy Conversion for Resilient Renewable-Driven Microgrids

#### Organized and co-chaired by:

- Dr. Ravi Bhushan, NIT Jamshedpur, Jharkhand, India
- Dr. Ravi Raushan, NIT Surathkal, Karnataka, India
- Dr. Prashant Kumar, Tennessee Tech. Univ. Tennessee, USA

ravibhushan.ee@nitjsr.ac.in  
ravi.raushan@nitk.edu.in  
pkumar@ntech.edu

#### Call for Papers

##### • Technical Outline of the Session:

This special session focuses on the convergence of adaptive control strategies and power electronic systems within renewable-integrated microgrids, emphasizing resilience, autonomy, and real-time energy management. Unlike broad tracks on power systems or renewable energy, this session hones in on microgrid-level innovations, exploring how intelligent controllers, decentralized decision-making, and advanced energy conversion technologies can be co-designed to enhance performance under dynamic environmental and grid conditions. Topics include coordinated control of renewable inverters, fault-tolerant energy management, power quality enhancement using converters, and integration of hybrid energy storage. The session aims to bridge the gap between theoretical control design and practical microgrid deployment, fostering collaboration between control engineers, power electronics experts, and renewable system designers to support next-generation energy resilience. The rise of solar, wind, and hybrid energy sources makes microgrids vital, requiring localized intelligence, adaptive control, and resilient systems to manage intermittency, ensure stability, and maintain power quality.

##### • Topic of the Session includes, but are not limited to:

- Adaptive and Intelligent Control Strategies for Renewable Resources Integrated Microgrid.
- Design of Power Electronic Converters and Interfaces.
- Coordinated and Decentralized Control of Renewable based Microgrid.
- Fault-Tolerant and Resilient Operation of Smart Grids.
- Power Quality and Stability Enhancement of Islanded and Grid-Connected RES.
- Integration of Hybrid Energy Storage System (HESS).
- Case Studies and Practical Implementations of Advance Controllers.

##### • Important Dates:

- Special Session Paper Submission Due : June 15, 2025
- Notification of Paper Acceptance : July 31, 2025
- Camera Ready Paper Submission Due : August 31, 2025
- Regular Registration Due : October 30, 2025

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