Call for Papers for the Special Session on

Emerging AI and Quantum Technologies for Secure and Resilient Future Power Systems

Organized and co-chaired by

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Technical Outline of the Session and Topics

Global power systems are transforming through the adoption of renewables, distributed generation, and advanced control. Future grids must be intelligent, interconnected, and resilient. Artificial intelligence and quantum technologies enable predictive analytics, secure communications, and optimisation, making their convergence essential to address cyber-physical threats, the complexity of renewable integration, and resilient grid operation.

Topics of the session include, but are not limited to:

- AI-driven predictive maintenance and fault detection in smart grids
- Quantum optimization algorithms for energy dispatch and grid stability
- AI and machine learning for power system operation and control
- Quantum-enhanced machine learning for grid forecasting and resilience
- Integration of quantum communication for secure grid operations
- Quantum sensing for efficient grid operation
- AI-based risk assessment and mitigation strategies for cyber-physical attacks
- Digital twins and data-driven Modelling of power networks
- Optimisation and energy management using AI
- Quantum technologies for high-precision monitoring and secure grid operation
- AI in power electronics and converter-dominated grids
- Edge, cloud, and federated learning architectures for power grid operations
- AI and quantum-enabled cybersecurity and cyber-physical resilience
- Integration of data centres and AI workloads into future grid control strategies

Timeline for Authors

All the instructions for paper submission are available on the conference website. Please visit www.iecon2026.org or scan the QR code for the timeline.