Special Session 35: Forecasting and Risk Estimation for Power System Operation under Extreme Weather Conditions

Session Organizers:

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Brief Description of the Session Thematic:

As renewable energy sources and weather-sensitive loads and equipment become increasingly prevalent in modern power systems, the operation of these systems becomes more susceptible to weather conditions. Extreme weather events, while infrequent, pose significant risks. The definitions, classifications, and impacts of these events remain ambiguous. Consequently, there is an urgent need to develop robust theories and methods for forecasting power generation and load, as well as estimating power system risks during extreme weather conditions.

This session will focus on analyzing extreme weather phenomena and their effects on power systems. It will also explore forecasting techniques for renewable energy power generation and load during extreme weather conditions, as well as methods for estimating the risks involved in power system operations under such conditions. A particular emphasis will be placed on leveraging cutting-edge artificial intelligence technologies to address these challenges effectively.

Topics and Keywords:

The topics of this session include but not limited to:

1. Data-driven identification and analysis of extreme weather events
2. Impacts of extreme weather on renewable energy power generation and load
3. Impacts of extreme weather on power system operation
4. AI-based methods for renewable energy and load forecasting under extreme weather conditions
5. AI-based methods for estimating power system operation risks under extreme weather conditions
6. Small-sample augmentation methods for extreme weather events using AI technologies
7. Few-shot learning technologies and methods for forecasting and estimation tasks under extreme weather conditions