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Special Session 12
Smart Grid Resiliency

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Scope of the Session:

The drive for clean and green energy sources has resulted in new directives to enhance, and in certain cases even replace the existing fossil-fuel based sources with renewables. With the inclusion of the various distributed energy resources (DERs) such as distributed generation, load, electric vehicles, and energy storage, the task of maintaining the same stability and reliability becomes very challenging. The penetration of renewable energy based DGs in the network challenge the traditional protection schemes and may bring in issues such as poor voltage profile, frequency deviations and protection failure mainly due to their intermittent nature. Hence, different innovative techniques and technologies to enhance the resiliency of the power grids and make it self-healing are imperative.

Smart solutions to make the grid anticipate, detect and respond to power outages as soon as possible can contribute to improving the grid resiliency. Analytical methods or simulation-based approaches such as Monte-Carlo approaches can be implemented to solve the reliability issues caused by the integration of renewable energy sources. Solutions based on multi-agent platforms for critical decision-making can also be employed for dynamic reconfiguration of the network during outage mitigation.

This special session is aimed at bringing together the new generation of methodologies and solutions for the development of truly sustainable and smart grids.

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

- Challenges in the protection of power grids with Distributed Energy resources
- Fault Analysis and Adaptive protection of Smart grids
- Modelling and Simulation of impacts of extreme events on power grids
- Self-healing power grids
- Power Island Detection techniques
- Artificial intelligence and Computational intelligent schemes for grid resiliency
- Reliability Metrics and Assessment
- Outage mitigation and Service Restoration
- Active Network management
- Energy storage systems for improving Grid Resiliency
- Distribution system asset management
- Internet of things (IoT) for grid resilience
- Ancillary support systems for Grid Resiliency
- Risk Analysis and Evaluation of renewables in Grid Resiliency
- Smart grid control and dynamic reconfiguration
- Role of Smart grid communication and control network in Grid Resiliency