

Introduction Electric Energy Systems Track

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Electric Energy Systems track seeks to explore methods at the frontier of understanding the next generation electric power system. It focuses on engineering, economics and policy issues that are at the forefront of current research, development, and demonstration. The track contains four minitracks each having two sessions with total of eight sessions scheduled sequentially to allow those interested to attend all sessions in the track.

The first minitrack is on electric power system monitoring control, and protection. The first session focuses on issues associated with large-scale power system dynamics and control. Issues covered include data mining applied to determining anomalies in power system synchrophasor measurements, optimization algorithms used at electric substations and voltage collapse margin estimation. The second session addresses issues associated with how the electric grid command and control can be modified to work in a less centralized configuration. This will be required to accommodate the growing number of distributed resources with dispersed intelligence and diverging objectives.

The second minitrack focuses on enhancing the resilience of the electric power grid. The first session contains presentations on data analytics and decision support. This includes considering distribution system reconfiguration, weather impacts on cascading outages and better ways to integrate weather data into electric grid outage applications. The second session looks at

testbeds and synthetic electric grids. The session covers many aspects of how synthetic electric grids can be constructed, validated and used.

The third minitrack has two sessions dealing with topics related engineering and economic interactions within the electric grid focusing on markets, policy and computation. The first session looks at new frontiers in electric market design and analysis. optimization of power systems. The focus is on the challenges presented in integrating electric and natural gas markets and also the design of electric capacity markets. The second session explores issues related to how new work in optimization is being applied in this area. Presentations include reserves available from controllable electric load, consideration of electric grid reliability and improvements in power system estimation.

Finally, the fourth minitrack explores the challenges of integrating distributed and renewable resources into the electric power grid. With the continued strong growth of wind generation worldwide, and the rapid growth rate for solar, grid integration and management of these resources continues to be an area of great research need. In the second session new approaches, models and methods on the coordination of such distributed energy resources are considered. The first session covers issues associated with renewable resources and demand response.