

Presentation Title:

Mitigation of Cascading Outages and Prevention of Blackouts: System-Wide Corrective Control

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Lei Ding (M'2010) received his B.E. and Ph.D. degrees from Shandong University in 2001 and 2007, respectively, in Electrical Engineering. He was a postdoctoral researcher at Tsinghua University, China, from 2008 to 2009, and was a Research Associate at The University of Manchester from 2010 to 2011. He is currently a professor at the School of Electrical Engineering, Shandong University, China. His main research interests include wide-area protection and control, integration of renewable energy.

Presentation Abstract:

To maximize profit and utilization of all available generation and transmission assets, many electrical power systems operate relatively close to their stability limits. Therefore, large power system disturbance may cause the electrical power system to become unstable and to enter a state of wide-spread cascading outages, which might lead to a partial or entire power system blackout.

If the integrity of the electrical power system cannot be maintained, a potential solution is to intentionally split the electrical power system into smaller subsystems through Controlled Islanding. As a system-wide corrective control measure, Controlled Islanding can prevent uncontrolled system separation, mitigate cascading outages and protect the system from experiencing a costly blackout.

This keynote addresses the questions about where to split and when to split power system. Furthermore, a discussion of the Smart Grid Technologies that are key enablers of system-wide corrective control will be provided. This will include a discussion on the application of Synchronized Measurement Technology, fast communication infrastructures and supercomputers, which will be accompanied by practical, illustrative examples.

