

MICROGRIDS: A NEW HUB IN ELECTRICITY INFRASTRUCTURE

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Microgrids represent smaller-scale version of centralized electric power systems which are established by communities within larger power systems. Microgrids achieve specific goals pertaining to distributed power systems which include higher reliability and fewer outages, higher resilience with self-healing capabilities, higher sustainability with more diversification of energy resources, higher energy efficiency and lower operating costs. Microgrids provide a more robust control of integrated renewable resources at the community level and allow customer participations in the operation of an electricity infrastructure. Microgrids form the building blocks of perfect power systems which promote the use of real-time pricing and demand response for optimizing the distributed control of electric power systems. This presentation will highlight some of the key issues in the design and the operation of microgrids and discuss the role of recent innovations and, in particular, the significance of smart grid applications to power system operations and control. The presentation will also discuss the development of a hybrid AC/DC microgrid which is funded by the U.S. Department of Energy and implemented at Illinois Institute of Technology.