Breakout Session 4: Steady State Control and Coordination

Report-out Presentation: Topic B Interaction of Microgrid with Utility or Other Microgrids

By:

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Framing of the Topic (15-20mins)

- **What is covered**

  Utility owned vs. customer owned microgrids

  Microgrid to microgrid

  Microgrid as a solution for distribution utility

Framing of the Topic (15-20mins)

- **What is not covered**

  Weather prediction

Current Technology Status (~15min)

- **State of the Practice**
  - DER is deployed singly
  - Microgrids are not considered as a grid resource
  - Building EMS
- **State of the Art**
  - Virtual power plants
  - Demand aggregation
  - Community EMS
- **Current R&D activities**
  - Beginnings of looking at federated microgrids
  - Using microgrids for peak shaving
  - V2G

Needs and Challenges (~15min)

- **What is needed and why**
  - Use microgrid to counter intermittency
  - State mandates , DOD mandates to address the challenge of increasing the penetration of renewables
  - Potential risk of microgrids to add instability (does self optimization create optimization for the distribution system) Rogue agents?
  - How do we address gaming? Arbitraging impact?
  - Need for more flexible resources for operating distribution systems (to manage renewables at high penetration levels) ; solution = microgrids
  - Need better cooperation between utilities and microgrid developers
  - Microgrid value proposition (technical and economic) for distribution utilities
  - Show utilities how microgrid can contribute to their operations, reliability, etc.

R&D Scope next 5 years (~40min)

- **Description of the R&D scope responding to the challenges and needs**

  Evaluate microgrids against other existing utility mitigation tools and schemes to support a) the integration of renewables, b) the “new contingency” of intermittent resources , and c) all other contingencies on distribution and transmission systems. Multiple scenarios. Survey of utility needs.

  Evaluate the potential negative effects of multiple microgrids on the stability on the grid and potential regulatory, economic incentives and control schemes that could be used to mitigate them.

  Develop tools for distribution to manage microgrids and their resources in cooperation with other distribution resources (assets) in “RDO” (regional distribution operator). From routine operations - high probability, low consequence events to emergency events – low probability, high consequence events.

  Develop a technical, operational, and economic model to demonstrate the value of microgrids to utilities through simulation and case studies (e.g. evaluate how microgrids could have helped during the NE outages (October 2011)