Grid Transformation Workshop

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Workshop Objectives

- How is the industry addressing uncertainty and risk in modeling and decision making?
- What is the state of research in risk-based planning?
- What tools and methods are available and what resource commitments are required for achieving benefits?
- What are the barriers to moving to risk-based planning ?
- How Reliability Standards can enable risk-based planning?

Workshop Objectives

- How does today's discussion help build a maturity model, strategy, or vision towards application and implementation?
  - Are there any "low hanging fruit" we should be aware of and pursuing?
  - What is our current state and what are the next steps for "grid transformation"?
  - Are there any pilot projects that can be deployed to test these methods?

Words of Wisdom

- "Face reality as it is, not as it was, or as you wish it to be." *– Jack Welch, former CEO, GE*
- Plans are nothing, planning is everything."
  – Dwight D. Eisenhower, 34th President
- "In order to be in control in a changing environment, your control system must be as dynamic as its environment."
  – Roger Brooks, Oliver Wight Americas

What is Grid Transformation?

- BPA definition:
  - Informed decision making and compliance through *risk-based planning*
  - Improved grid flexibility through innovative solutions such as *power flow controls and non-wires*
  - Defense in depth controls to prevent cascading blackouts

Drivers of Grid Transformation

- Evolving power system - *uncertainty*
  - *Supply side*: renewable energy, hydro resource constraints, coal retirement, environmental regulations
  - *Demand side*: energy consumption, load composition, distributed generation
  - *Markets*: Changing market structure, new market products (EIM)
- Difficulty of conventional build solutions
  - Line permitting (environmental, legal)
  - Access to capital

Drivers of Grid Transformation

- Need for *grid flexibility*
  - To enable Dynamic Transfer Capability and EIM
  - Reliable integration of diverse resources
  - To defer large investments
  - To improve grid reliability
- Increased complexity of system operations
  - Need to improve system robustness with respect to wide variety of operating conditions
  - Need for operational flexibility, reduce impact of planned maintenance outages on system capabilities

Issues with the Planning Process

- Key assumptions are developed early
- Invalid due to inevitable changes
  - Relevant economical downturn
  - Uncertainty of industrial commercial loads
- Actual results versus planned
- Very conservative approach to loads, generation and transmission
- Contractual ATC and not used

Issues with the Planning Process (cont)

- Increased inventories
  - Supply organization starts out based on annual planning
- Low return on assets leaving a lot of capability on the table
- Increased operating costs resulting in artificially high budgets

Where We Are Today…

- Lack of institutionalized processes for assessing uncertainty and risk
- Mostly deterministic planning criteria for decision making
- Limited ability to control power flows
  - Main grid capability is limited by lower voltage underlying sub-transmission
- Gaps exist between planning and operations

…And Where We Want to Be

- Institutionalized risk-based planning
- Risk-based decision making
- Deferment of large capital investments through technology innovation solutions
- Grid flexibility for increased capacity and better utilization of existing assets
- Better coordination between planning and operations environments
- Defense in depth against cascading outages

Thank you!