

Industry Experience with Risk-Based Planning

March 2013

What does Risk-Based planning mean?

- Moving contingencies from one performance category to another?
- Estimating energy unserved?
- Quantifying risk as a function of generation pattern, load level, transfers?
- Other?

What do we need?

Goals:

- Reliably serve loads from an increasing variety of resources
- Reliably and efficiently integrate renewable resources
- Optimize grid utilization

Challenges:

- Developing future plans with uncertain assumptions
- Changing uses of the transmission system
- Scenario planning while meeting deterministic criterion
- Optimizing transmission system investment in the face of uncertainty

August 10, 1996 Disturbance – A wake-up call

Planning challenges:

- Benchmarking studies against actual system response
- Generation patterns not reflective of actual conditions
- Realistic Q limits/control of generators not captured
- Governor response modeled in P-T powerflow not realistic

Lessons learned:

- Studies model more realistic river operation
- Changes made to Q limits/controls, more realistic modeling, more requirements
- Governor testing, better modeling of governor response
- More rigorous studies for different scenarios
- More rigorous list of contingencies studied

What are we doing today?

Resources:

- Study more scenarios
- Challenges – Speculative requests, balancing resources with loads and exports in studies

High variable generation penetration:

- Study more scenarios, involved in Q coordination/control
- Challenges – Wind ramping, SPS

What are we doing today?

Demand:

- Using more historical data to temper load forecast
- Collecting more intelligence now to determine investment needs
- Challenges – Uncertainty in load forecast, speculative requests

Synchro-Phasors:

- Better visibility with high resolution data
- Model validation
- Disturbance validation

Some other challenges we are facing

- Modeling more realistic load characteristics
- Cyber threats
- Complex remedial action schemes
- Imbalance markets
- Shorter scheduling intervals
- Climate change initiatives
- Others

Industry experience

- Others experience with risk-based planning
- What value is realized, what measures are out there
- What resources are needed
- What is risk tolerance and who sets it