Helping our members work together to keep the lights on... today and in the future
SPP RTO
Voltage and Reactive Control

April 25, 2012

Richard Dillon/Jason Smith
rdillon@spp.org · 501.614.3228
State of Market Development at SPP

• Currently operating a real-time spot market
  – Alstom security constrained economic dispatch engine with an Alstom energy management system

• Developing next market (Integrated Marketplace or Marketplace) for March 2014 implementation
  – Day-ahead Market, Reliability Unit Commitment, Co-optimized Real-time Market, Reserve market and Congestion Rights
Market Products

• Current – Energy only

• Integrated Marketplace – Energy, Regulation, Contingency Reserves, Congestion Rights, Virtuals

• Neither market includes explicit products for voltage control and reactive power.
Voltage Control and Real-Time Operations

- Voltage Control is primarily a Transmission Operator function with SPP Reliability Coordinator providing a backup in both analysis and monitoring.
- Voltage profiles are determined by the Transmission Operator unless directed by the SPP RC.
  - Example: Outage Coordination required Operating Guide, system restoration, unforseen local issue, etc.
Voltage Control vs. Market Ops

• Real-time EIS Market is based on MW demand to serve real-time, real power balancing demand while meeting real power constraints (flowgate flows, NSI, etc.).

• To the extent possible, voltage or reactive control must be “translated” to a MW limitation.
  – Min/max MW flows on flowgates (control consumption of reactive power losses by the transmission system or require generation commitments)
  – Min/max targeted generator MW limitations (force MW limitation in order to achieve Mvar capability)
Voltage Control vs. Market Ops (cont.)

- Static and Dynamic (var only) Reactive devices
  - Use and outages are coordinated outside of the “market based” processes.

- SPP’s EIS has no commitment provision outside of reliability directives. Cost recovery by generators can be an issue.
  - Marketplace designed around centralized unit commitment with make-whole payments
Voltage Control vs. Market Ops (cont.)

- D-curve tradeoffs reflected by resource MW offer limitations by SPP or TOP.
- Day – Ahead market
  - Cost recovery issue for generator commitment addressed
  - Centralized commitment savings to resolve voltage/reactive issues.
  - No assessment of “optimization” of var flows continues
  - MW proxy limitations still required
  - Socialization of local issue resolution
Summary

• Support of Voltage and Reactive needs is included in the market systems as adjusted MW limits on flowgates and resources

• Transmission Operator and SPP Reliability functions work in tandem to anticipate and resolve anticipated issues

• Explicit market products do not exist in current design

• Inclusion of new market products in current time sensitive market systems will impact performance metrics