

A nighttime photograph of a city skyline reflected in a body of water. The buildings are illuminated with warm lights, and their reflections are clearly visible in the calm water. A bridge is visible on the left side of the frame.

Helping our members work together to keep the lights on...
today and in the future

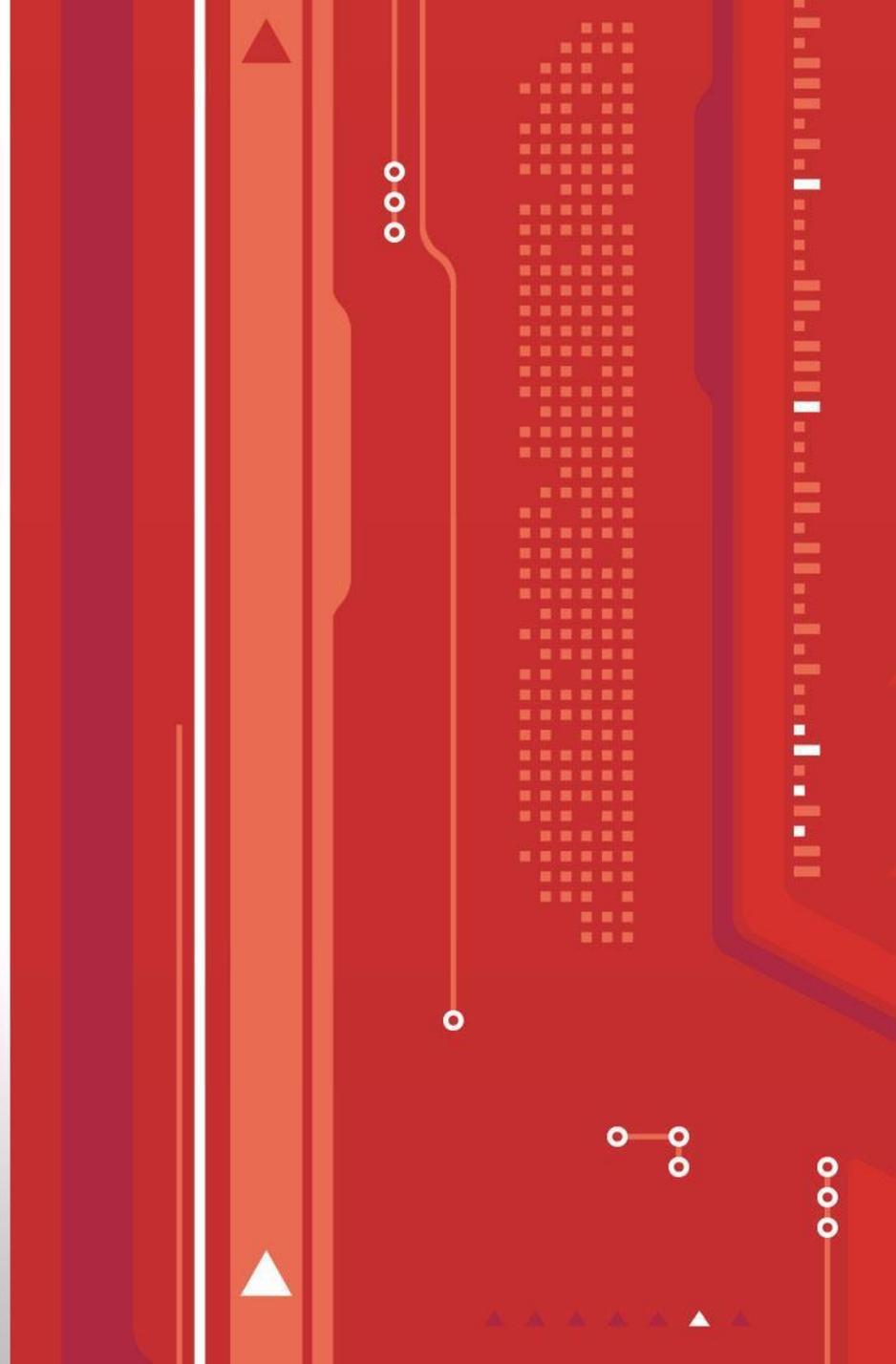
 **SPP** *Southwest
Power Pool*

SPP RTO

Voltage and Reactive Control

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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, unforeseen 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**