Helping our members work together to keep the lights on... today and in the future
SPP: Current approaches and challenges to voltage support and reactive margin in operations

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The SPP Difference

• Relationship - Based
• Member - Driven
• Independence Through Diversity
• Evolutionary vs. Revolutionary
• Reliability and Economics Inseparable
SPP’s Major Functions

• Reliability Coordination
• Transmission Service/Tariff Administration
• Energy Imbalance Service (EIS) Market Operation
• Transmission Planning

Regional
Independent
Cost-effective
Focus on reliability
What kind of markets does SPP have now?

• **Transmission**: Participants buy and sell use of regional transmission lines that are owned by different parties

• **Energy Imbalance Service (EIS)**: Participants buy and sell wholesale electricity in real-time
  – Market uses least expensive energy from regional resources to serve demand (load) first
  – Sometimes it’s cheaper for a market participant to purchase power from another provider than to generate
  – SPP monitors resource/load balance to ensure system reliability
SPP EIS Market Highlights

- Spot balancing energy market
- Locational Imbalance Pricing (nodal)
- Voluntary offers on resources
- Charges on imbalance energy
- Uninstructed deviation charge
- Hourly settlement
- Weekly invoicing
- Physical transmission rights
- Self-commitment of resources by owners
What type of new markets is SPP implementing?

• Integrated Marketplace will:
  – Provide participants with greater access to reserve energy
  – Improve regional balancing of supply and demand
  – Facilitate integration of renewable resources
  – Similar to existing “Day 2” markets to be implemented on March 1, 2014 but excludes capacity market

• Includes:
  – **Day Ahead**: SPP determines what generating units should run the next day for maximum cost-effectiveness
  – **Operating Reserves**: Market to buy and sell reserve energy that
    • Meets emergency needs
    • Regulates instantaneous load and generation changes
    • Maintains electricity quality (keeping voltage up, etc.)
What pre-scheduling activity of reactive resources occurs?

- SPP RC region has limited voltage concerns, in only two known areas, with very few non-thermal flowgates.
- Real-Time Contingency Analysis (RTCA) tool has capability to indentify contingency voltage concerns.
- Transmission Operator’s (TOP) are responsible for ensuring adequate reactive support with close RC coordination.
- TOP and RC Coordination takes place to mitigated any local area reactive concerns.
What type of tools are used in pre-scheduling?

- Real-Time contingency analysis (RTCA) in EMS
- Flowgate monitoring that represents voltage limitations
- Voltage contour mapping
- Balancing Authority reactive requirements assessments
Near and Real-time Economic considerations involved in the dispatch of reactive resources

- Reactive market not in place
- In SPP reactive options are limited due to sparse system in certain areas and limited ability to transfer Mvar’s
Evaluations of system impacts

• **Post Operational Assessments**
  – Weekly evaluations of each constraint is reviewed to evaluate efficiency of congestion management practices
  – Assessments identify opportunities for improving the system operation including reliability and economics
  – TOP requirements for lower voltage system are considered
  – How did actions taken impact reliability and economics?
  – Risk assessment is made on future actions

• **Pre-Operational and Real-Time Assessments**
  – Incorporate post operational assessment analysis using available tools
  – TOP/RC are in constant contact evaluating potential concerns
Reactive Resources and optimization

• SOL’s are not impacted by the dispatch of Reactive Resources

• Coordination of reactive power needs on distribution system is performed by the TOP/BA and coordinated with the RC
Reactive Considerations

- Reactive support is a local support with limited market availability
- Operations must be prepared for outages and contingencies
Reactive Considerations

Reliability and economics are inseparable

Pushing the system harder by propping up voltage will increase risk of outages, Limits reaction time to disturbances
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