CPP Panel Comments

PSERC Summer Workshop
July, 2015
SPP’s Energy Consumption and Capacity

**Capacity**
- Gas: 42.04%
- Coal: 34.08%
- Wind: 10.01%
- Hydro: 4.55%
- Dual Fuel: 4.06%
- Nuclear: 3.34%
- Fuel Oil: 1.83%
- Other: 0.08%

**Consumption**
- Coal: 61.2%
- Gas: 21.2%
- Wind: 10.8%
- Nuclear: 6.0%
- Hydro: 0.6%
- Diesel Fuel Oil (DFO): 0.3%
EPA’s Projected 2016-2020 EGU Retirements

*Excludes committed retirements prior to 2016
**Extracted from EPA IPM data
***THESE RETIREMENTS ARE ASSUMED BY EPA – NOT SPP!
SPP Oct 2014 Recommendations to EPA

- Technical conferences jointly sponsored by FERC and EPA to discuss
  - Reliability impacts
  - Impacts on regional markets
  - How to move forward to accomplish both reliability and environmental objectives

- Comprehensive nationwide analysis of reliability impacts before final rule issued

- Extension of schedule for compliance – at a minimum, interim goals extended at least 5 years

- Adoption of “reliability safety valve”
2015 Action Plan for SPP Analyses

• Initial regional assessment completed. SPP staff evaluated scenarios to capture implications of compliance on an RTO-wide basis to meet interim and final EPA CPP carbon emission goals as proposed June 2014. Results were driven by existing and potential resource plans, and carbon cost adders. SPP testimony provided at March 31st FERC Workshop in St Louis.

• Timeline of actions and implications of regional plan to ensure reliable compliance.

• State-by-state compliance assessment with initial results in July 2015.
Regional Compliance Study Findings

• Simplistic, copper sheet assessment

• $45/ton carbon tax results in NGCCs approaching 70% target capacity factor, but puts significant coal units at risk

• Above existing plans reflected in ITP10 models, regional compliance for CPP in SPP requires 1.2 GW of new gas units, as well as another 5.6 GW of new wind

• Almost $3B increase identified in term of annual costs for regional compliance

• SPP cannot continue to plan for “BAU”
Future Resource Plans in SPP

- Business As Usual scenarios do not seem appropriate anymore
- Environmental regulations like MATS, Regional Haze and Clean Power Plan, abundance of natural gas, and renewable developments are creating a paradigm shift to the bulk electric system
- Distributed generation, new technology and empowered consumers are reshaping grid operations and planning too
- Need certainty regarding retirements, conversions and additions, plus time to design, approve and implement efficient and effective plans for the future grid.
ERGIS

- NREL’s Eastern Renewable Generation Integration Study (ERGIS) regarding renewable penetrations and impact on grid operations in the Eastern Interconnect
- “SPP” is existing footprint without WAPA/Basin IS
- Transmission expansion leveraged EIPC models
- ERGIS incorporates solar expansion assuming mix with 60% utility-scale and 40% distributed generation
- RTx30 Scenario represents regional solutions with 30% renewable penetration, e.g., 51 GW of new wind in SPP
- ITx30 Scenario represents best interconnection wide solutions with 30% renewable penetration, e.g., 75 GW of new wind in SPP
Typical Summer Period – Total EI US

Preliminary Results
Typical Summer Period - SPP

Preliminary Results
SPP ITx30 – 96% Renewable Penetration

Preliminary Results
SPP ITx30 Exports – Time Series

Preliminary Results

Sink
- MISO
- PJM

Exports (GW)

Apr 03 12 AM
Apr 04 12 AM
Apr 05 12 AM
Apr 06 12 AM
SPP ITx30 – Annual Exports Duration Curve

Preliminary Results

Sink
- MISO
- PJM

Exports (GW)

Hours

2000 4000 6000 8000
SPP’s Observations

• SPP renewable exports are expected, but imports may not be. Imports in these simulations appear to be a significant opportunity to improve grid operations and economics. Transactions between SPP and PJM are limited to assumed HVDC tie capacities.

• Curtailments indicate further refinements are needed.

• System security with high renewable penetrations is likely to be problematic, as may be flexibility of existing and planned resources for these scenarios.

• What diversity between “SPP” and the 24GW of renewables added to WAPA/Basin IS under ITx30 is being shown as transactions with MISO
Jay Caspary
Director – Research, Development & Special Studies
501.614.3220
jcaspary@spp.org