
Helping our members work together to keep the lights on...
today and in the future
SPP
Southwest
Power Pool

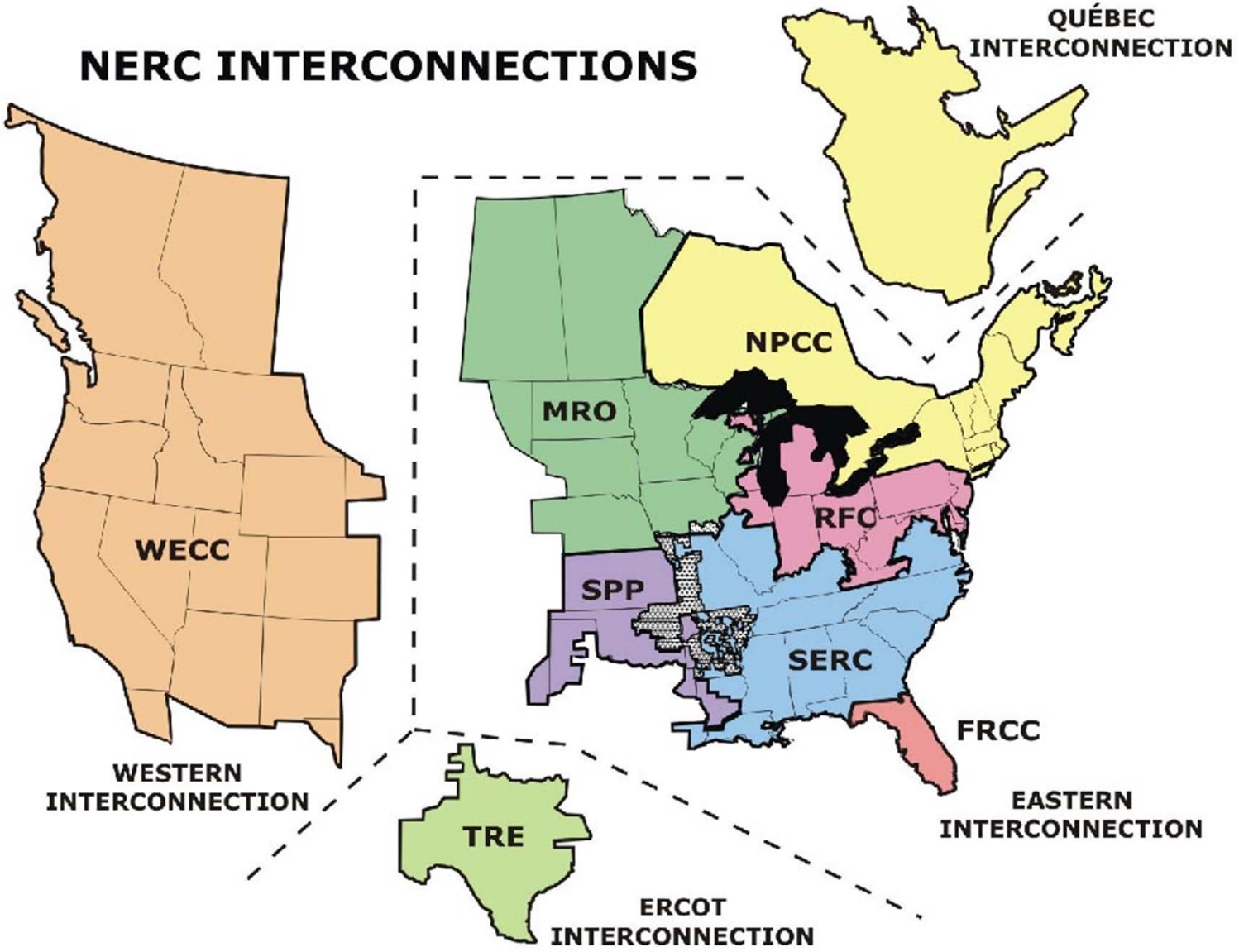
SPP Reliability Assessment Based on EPA CSAPR Model

Missouri PSC

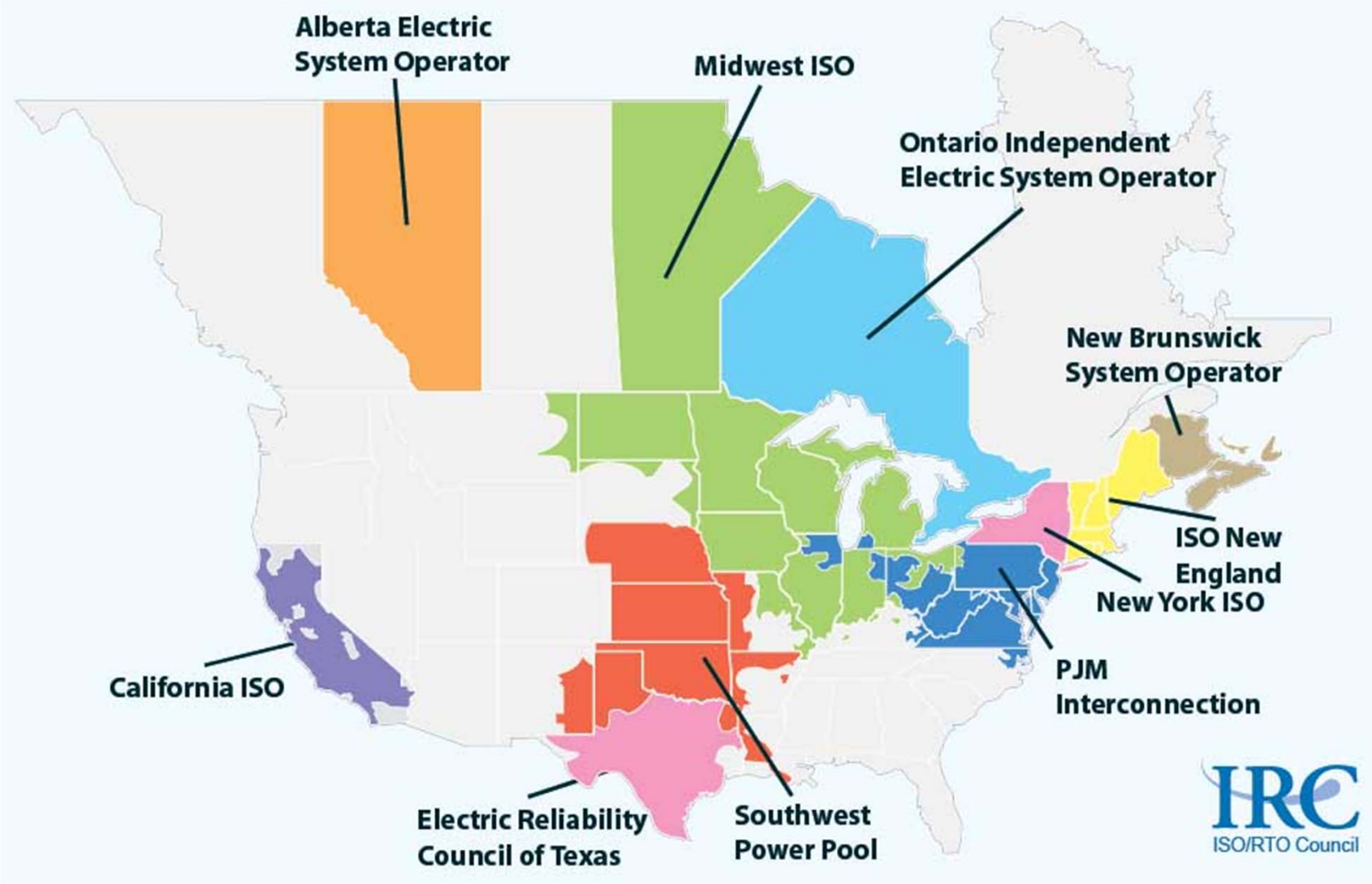
October 26, 2011

SPP Southwest Power Pool

3 Interconnections / 8 NERC Regions

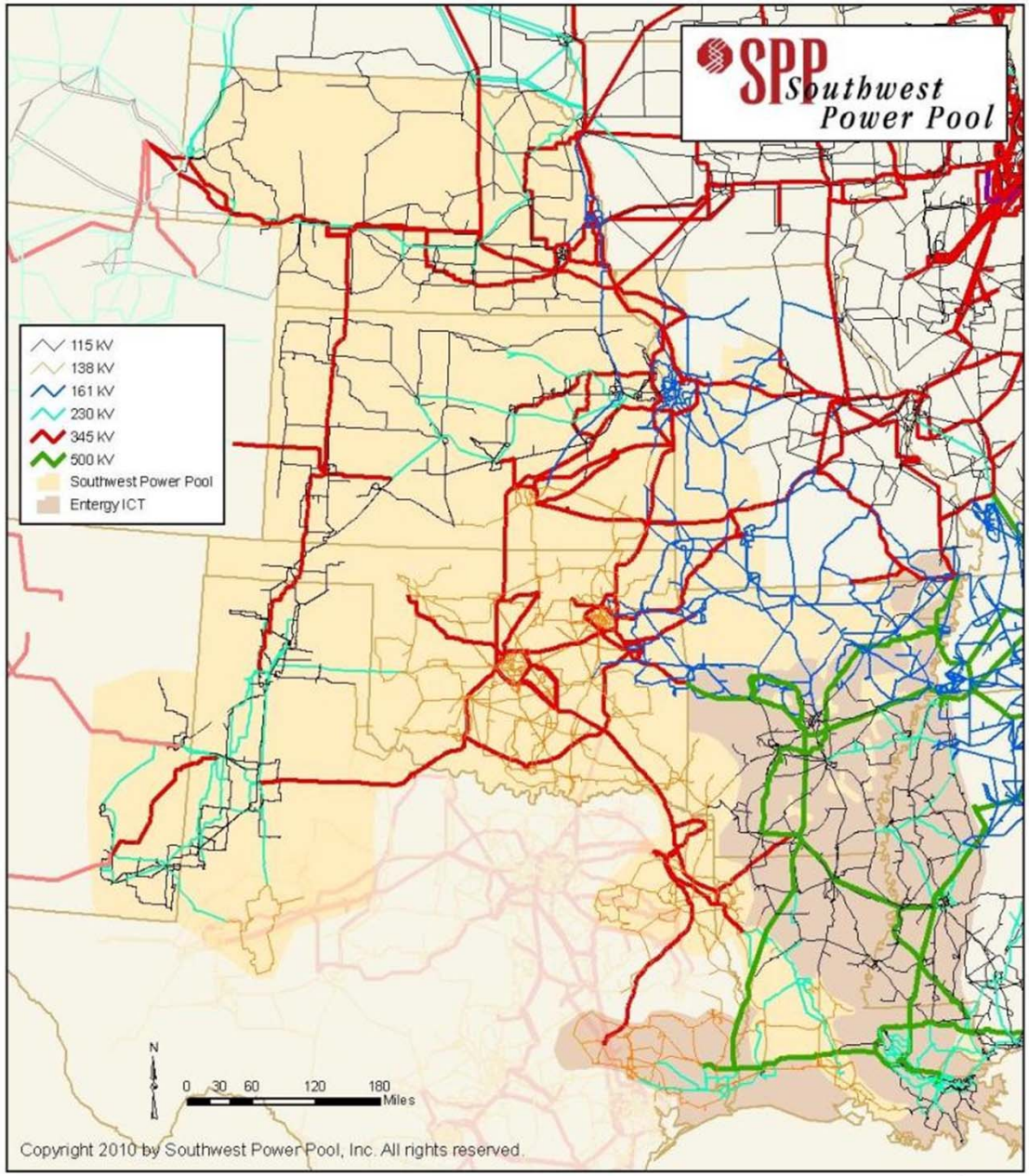


ISO / RTO Map


Alberta Electric System Operator
Midwest ISO
Ontario Independent Electric System Operator
New Brunswick System Operator
ISO New England
New York ISO
PJM Interconnection
California ISO
Electric Reliability Council of Texas
Southwest Power Pool
IRC
ISO/RTO Council

SPP Region

- 370,000 square miles
  service territory
- 859 generating plants
- 6,101 substations
- 48,930 miles transmission:
  - 69 kV – 12,722 miles
  - 115 kV – 10,143 miles
  - 138 kV – 10,009 miles
  - 161 kV – 5,097 miles
  - 230 kV – 3,787 miles
  - 345 kV – 7,079 miles
  - 500 kV – 93 miles



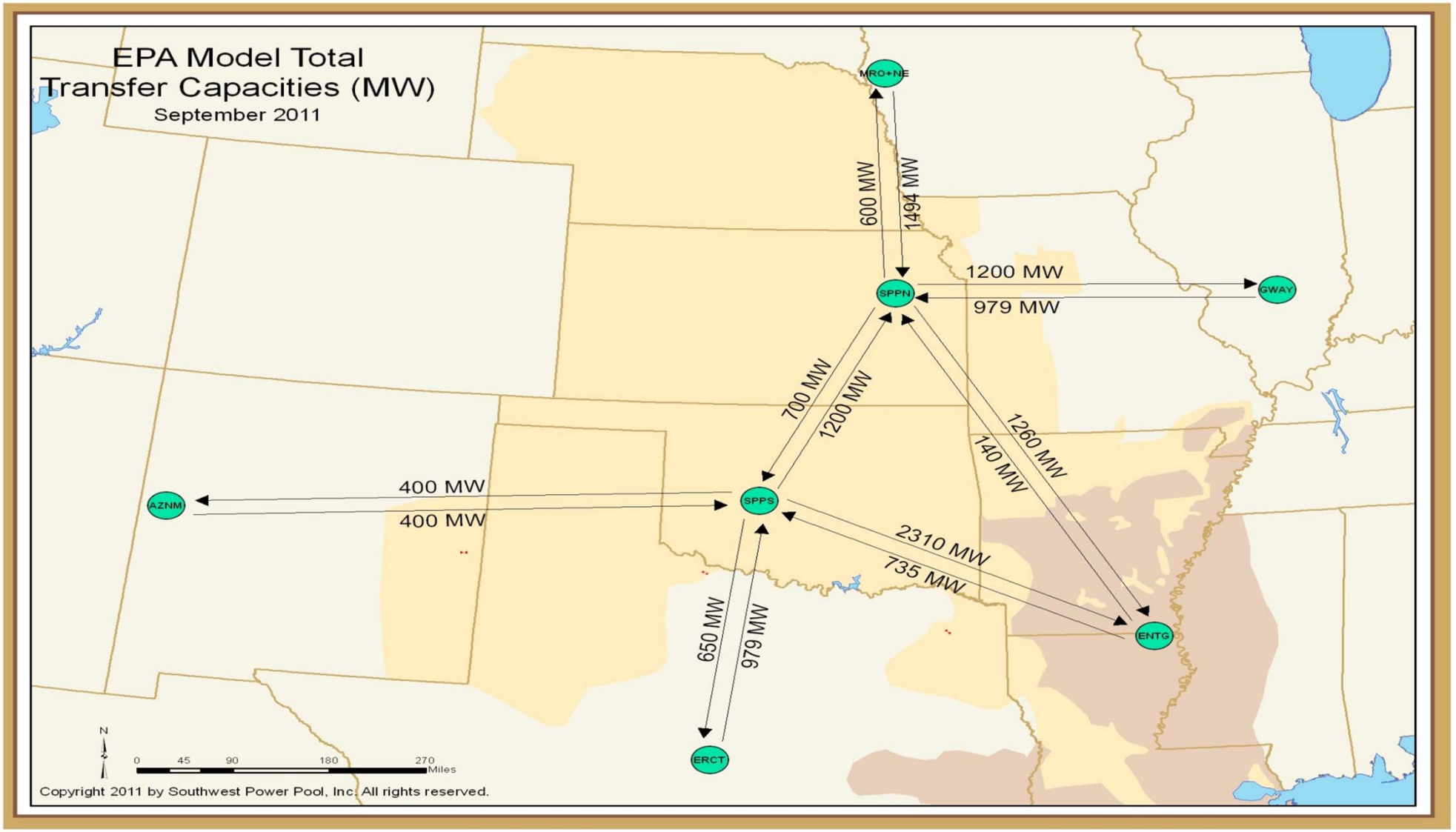
SPP Studies/Letters on EPA Rules

- July 19 letter to EPA based on cursory analyses of 4 EPA Rules with projected 2013 and 2015 reserve margins for select scenarios, including worst case
- Subsequent CSAPR assessment for 2012 using EPA IPM model results are input into comprehensive reliability assessment using powerflow models
  - Note this assessment did not consider Oct 2011 EPA technical adjustments for CSAPR that affect SO2 for Texas and JEC allowances, among others
- September 20 letter to EPA for study and conclusions in slides 7 - 18

EPA CSAPR Model Assessment Scope

- This assessment determined how SPP's 2012S ITPNT model performed when generation not deployed by the EPA in the Cross-State Air Pollution Rule (CSAPR) IPM model, was made unavailable
- EPA projects zero fuel burn at many other SPP units that were not dispatched in the 2012S ITPNT model which reflects summer peak conditions
- EPA allocated pollution credits which were not evaluated in this CSAPR reliability assessment

EPA MODELING ASSUMPTIONS FOR TTC



Process

- Determine which SPP generation in the EPA model consumed no fuel
- Redispatch SPP resources to remove affected EPA units from SPP's 2012S ITPNT model
- Document process and focus on Criteria violations
  - Run power flow simulations to identify N-1 contingencies that caused:
    - Thermal loadings above 100% of facility emergency ratings
    - Voltages below 90% of nominal levels

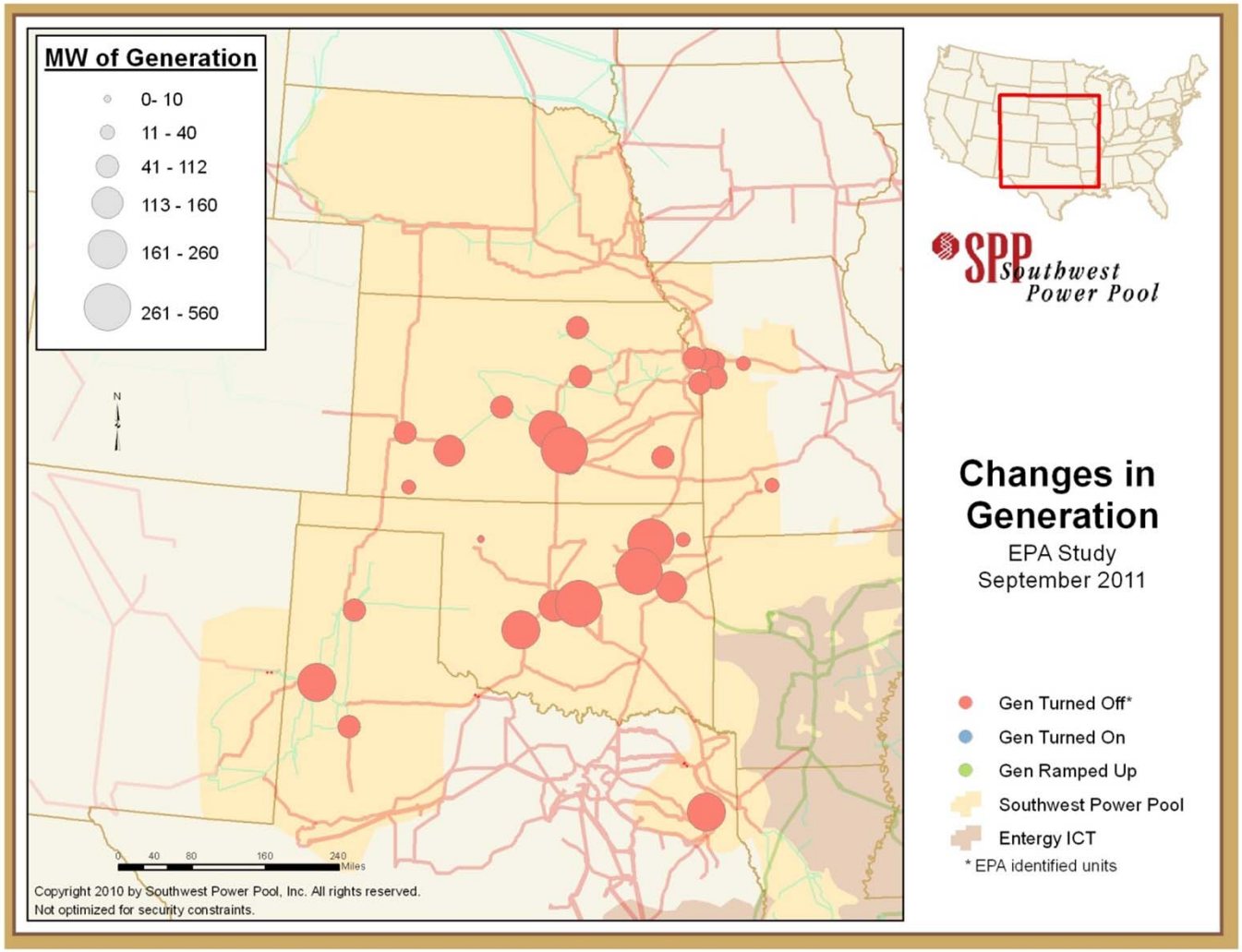
SPP Dispatch Changes

- EPA model for CSAPR shows 114 units in SPP RE footprint with nameplate capacity of 10.9 GW with zero fuel consumption in 2012
- In the EPA base case load flow model, SPP turned off 48 units accounting for 5.4 GW of generation in the 2012S ITPNT model and redispatched using approaches consistent with other planning studies
- The number of units generating less than 25 MW increased from 13 to 80

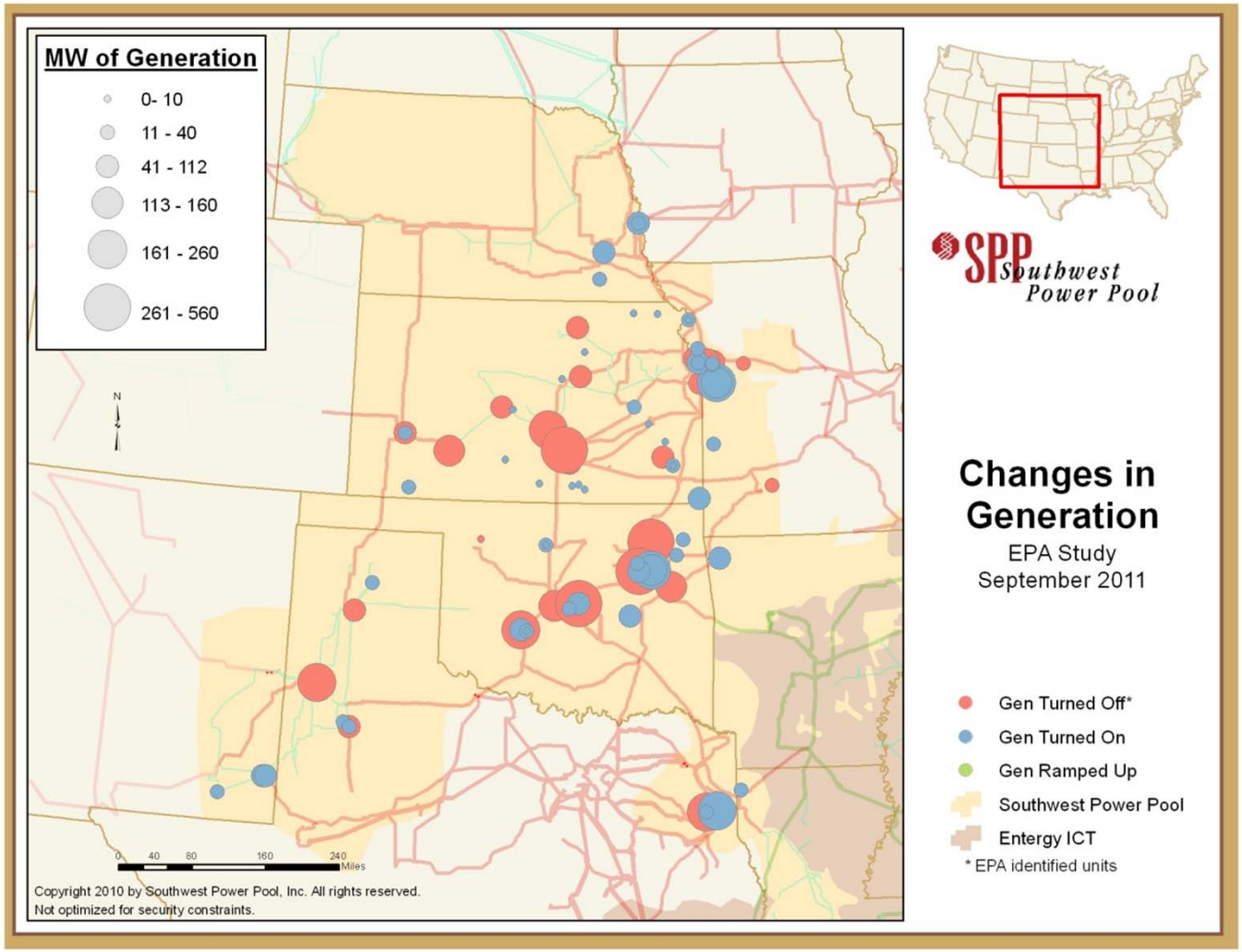
SPP Dispatch Changes cont.

- Generation redispatch was not refined to address security constrained economic dispatch needs, which may not even be achievable in many respects
- While system load did not change, total SPP resources increased by 106 MW due to increased losses in the new EPA base case compared to the 2012S ITPNT base case

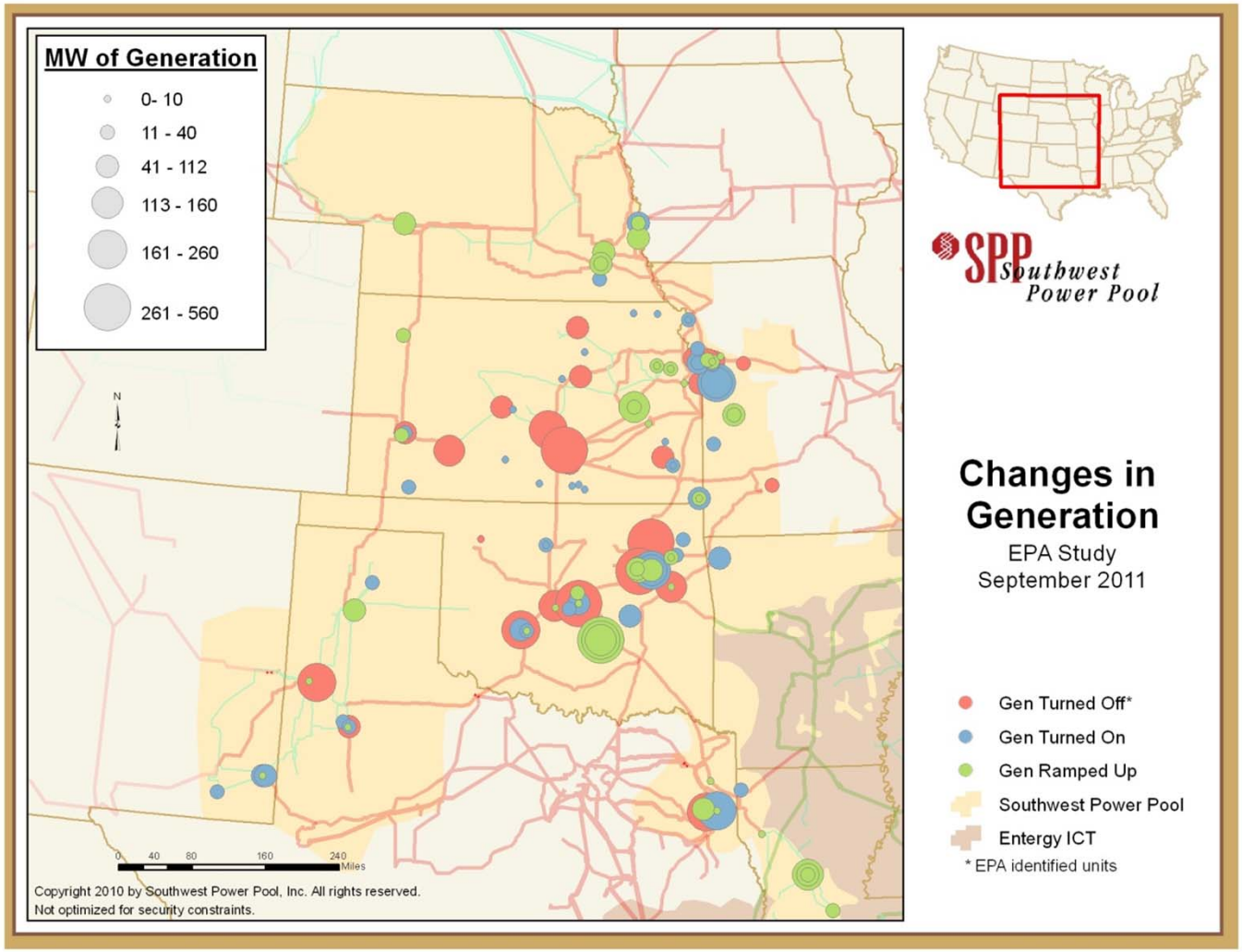
2012S ITPNT Generation Not Used in EPA



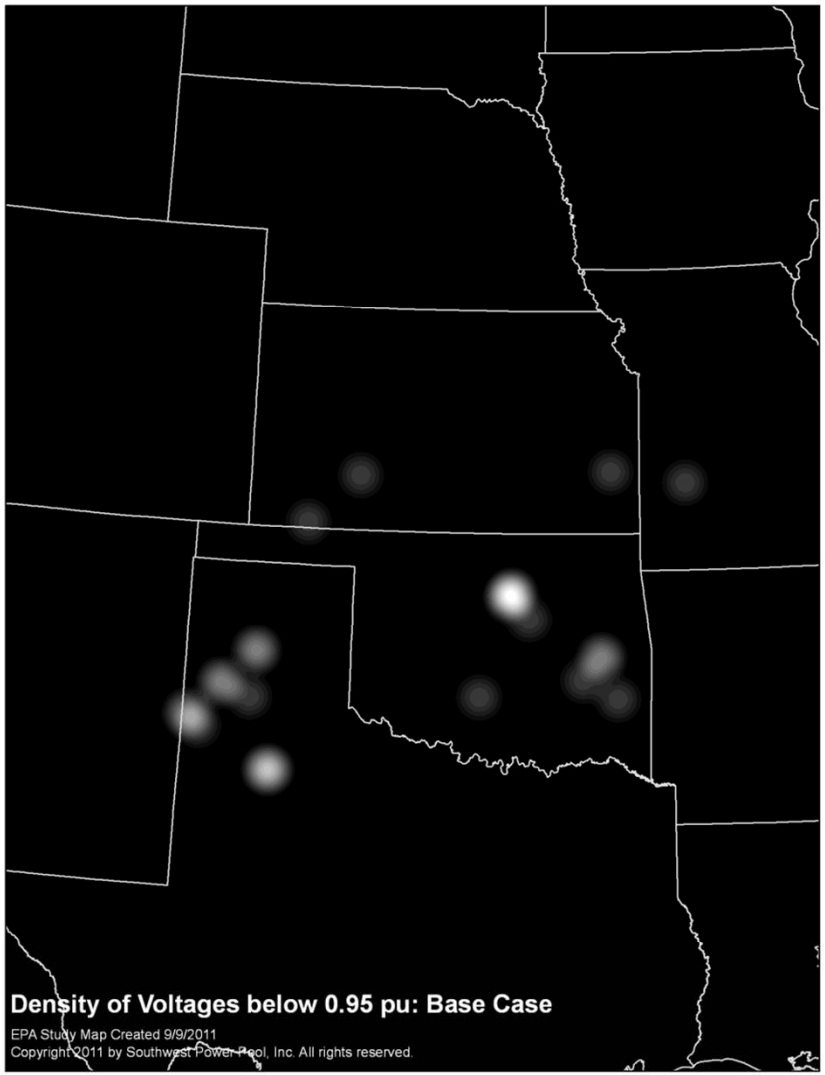
+ Units Committed to Replace Lost EPA Units

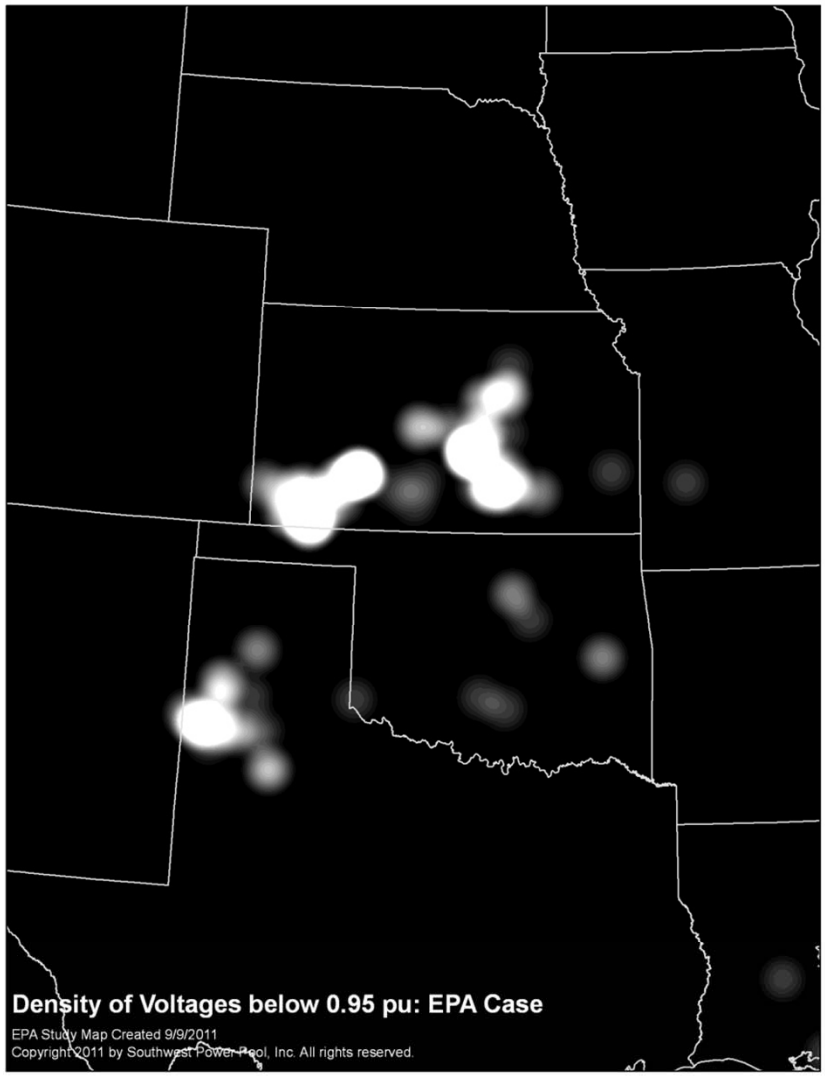


+ 2012S ITPNT Units Ramped Up



System Intact Voltages below .95 p.u.





Criteria Violations

- No consideration of operating directives or potential redispatch solutions
- Focus SPP Criteria 3.4.1.2
- 30 Non-converged cases
- N-1 Violations for solved cases, includes solutions for 19 of the Non-converged cases
  - >100% Emergency Rating N-1 thermal overloads – 220
  - Voltages below 90% for N-1 – 1047
- 11 cases where unable to achieve any solution

Compliance concerns

- Extreme reliability standard violations are problematic because mitigation plans will be difficult, if not impossible, to determine and implement
  - 16 overloads above 120% of emergency ratings for N-1
  - 93 circumstances with voltages below .85 p.u. for N-1
- Notwithstanding, there are concerns about the 11 contingencies that would not even solve. These scenarios represent circumstances under which drastic measures may be required to maintain system security in advance of potential outage of almost any EHV source in western SPP

Highlights of SPP Letter to EPA on 9/20

- SPP has found if the EPA's IPM modeling assumptions were to be deployed during 2012 Summer peak conditions, then FERC and NERC regulations would be violated.
- SPP suggested that the EPA delay CSAPR's effective date at least a year to allow for investigating, planning and developing solutions to assist members in maintaining grid reliability and compliance

Sharing study inputs, outputs, models, etc…

- Challenging to share study inputs and outputs
  - Stakeholders must have an updated individual non-disclosure agreement to gain access to this information
- Models have been posted, as well as summary results, to TrueShare for review
- Company specific data has been shared, as appropriate

Reaction from EPA and Stakeholders

- House hearings 9/22 with Burgess quote in SNL
- WSJ Editorial 9/26 with following concluding paragraph:
  - "The best option would be for the EPA to write less destructive rules that don't jeopardize reliability in the first place. Failing that, we should at least know the risks before it is too late. In a letter to Mr. Wellinghoff last week, Mrs. Murkowski simply asks that FERC undertake some kind of study of the EPA's agenda in line with its statutory obligations and the warnings of its own experts. If FERC won't do it, someone else should."

Coordination with ISO/RTOs and REs

- SERC is reviewing SPP EPA study and seems likely to replicate SPP's cursory reliability assessment for its footprint. SPP staff is supporting SERC as needed
- Letter shared with ISOs/RTOs
- ISOs/RTOs considering other actions

Recent Developments

- Numerous discussions with FERC, EPA, members, affected parties/agencies, etc
- SPP has worked with ISO/RTOs to propose rules to the EPA for independent certification of generation required for reliability needs in response to MACT. "Reliability Safety Value" proposal was posted 10/21 to SPP website
- SPP staff is drafting a survey of generation owners to compile compliance plans associated with EPA Rules for further analyses which will be distributed shortly
- Participate in FERC Technical Conferences in DC on November 29-30