BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of an Investigation of the Cost to Missouri's Electric Utilities Resulting from Compliance with Federal Environmental Regulations	)))	File No. EW-2012-0065

SUPPLEMENTAL RESPONSIVE COMMENTS OF SOUTHWEST POWER POOL, INC.

COMES NOW Southwest Power Pool, Inc. ("SPP"), by and through counsel, and submits the following Supplemental Comments in response to the Missouri Public Service Commission's ("Commission") July 30, 2014 Order Directing Response to Certain Questions and August 6, 2014 Order Directing Response to Additional Questions. On October 9, 2014, SPP filed comments with the Environmental Protection Agency on its "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" ("Clean Power Plan" or "CPP") proposed rule that was published in the Federal Register on June 18, 2014. A copy of SPP's comments, as well as SPP's reliability impact assessment of the CPP proposed rule, are attached hereto as Exhibit A. SPP's Comments filed with the Commission on September 16, 2014 indicated that these documents would be subsequently provided to the Commission.

Respectfully submitted,

/s/ Mark W. Comley
Mark W. Comley #28847
NEWMAN, COMLEY & RUTH P.C.
601 Monroe Street, Suite 301
P.O. Box 537
Jefferson City, MO 65102-0537
(573) 634-2266
(573) 636-3306 FAX
Email: comleym@ncrpc.com

and

Erin Cullum Marcussen, AR BIN 2004070
Southwest Power Pool, Inc.
201 Worthen Drive
Little Rock, AR 72223
Telephone: (501) 688-2503
Email: ecullum@spp.org

Attorneys for Southwest Power Pool, Inc.

Certificate of Service

I hereby certify that a true and correct copy of the above and foregoing document was sent via e-mail on this 13th day of October, 2014, to General Counsel's Office at staffcounselservice@psc.mo.gov; and Office of Public Counsel at opcservice@ded.mo.gov.

/s/ Mark W. Comley

EXHIBIT A

October 9, 2014

VIA ELECTRONIC FILING

Gina McCarthy, EPA Administrator
Environmental Protection Agency
1200 Pennsylvania Ave NW
Washington, DC 20460

Re: Docket ID No. EPA-HQ-OAR-2013-0602

Dear Administrator McCarthy:

This letter is submitted to the United States Environmental Protection Agency ("EPA") on behalf of Southwest Power Pool, Inc. ("SPP") in its capacity as a Federal Energy Regulatory Commission ("FERC") approved Regional Transmission Organization ("RTO") and a Regional Entity with delegated authorities to ensure the reliability of the bulk electric system within the SPP region[1].

The purpose of this letter is to convey SPP's comments on the "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" ("Clean Power Plan" or "CPP") proposed rule that was published in the Federal Register on June 18, 2014.

Specifically, SPP will address three primary areas of concern: 1) the CPP will impact reliability of the bulk electric system; 2) the timing proposed by EPA for compliance is infeasible; and 3) the proposed CPP will have material impacts on the market-based dispatch of electric generating units within the SPP region.

[1] SPP is an Arkansas non-profit corporation with its principal place of business in Little Rock, Arkansas. SPP has 78 members that include investor-owned electric utilities, municipals, electric cooperatives, state authorities, independent power producers and independent electric transmission companies. As an RTO, SPP administers open access Transmission Service over approximately 48,930 miles of transmission lines covering portions of Arkansas, Kansas, Louisiana, Missouri, Nebraska, New Mexico, Oklahoma, and Texas, across the facilities of SPP's Transmission Owners. SPP administers its centralized day-ahead and real-time energy and operating reserve markets ("Integrated Marketplace") with locational marginal pricing and market-based congestion management processes to deliver wholesale energy to its customers in the most economic and reliable fashion. As an RTO, SPP also plans for and functionally controls the transmission infrastructure committed to it. For purposes of these comments, SPP has included the Integrated Systems utilities, which are in the process of joining the organization.

To address these areas of concern, SPP is providing four recommendations: 1) a series of technical conferences jointly sponsored by the EPA and FERC; 2) completion of a detailed, comprehensive and independent analysis of the impacts the proposed CPP will have on the reliability of the nation's bulk electric system; 3) extension of the proposed schedule for compliance in order for the necessary electric and gas infrastructure to be identified and constructed; and 4) adoption of a "reliability safety valve". SPP appreciates the opportunity to submit comments and provides the following explanation of its concerns and recommendations.

Pursuant to the Energy Policy Act of 2005, FERC has approved mandatory and enforceable reliability standards promulgated by the North American Electric Reliability Corporation ("NERC") with which the electric industry must comply. Contained in these standards are key requirements necessary to ensure the bulk electric system meets an adequate level of reliability. Failure to comply with these standards affects the ability of the power grid to operate reliably and subjects registered entities such as SPP and its member utilities to civil monetary penalties[2].

These reliability standards require SPP to ensure electric transmission lines are not overloaded and voltage is maintained within certain prescribed limits in the event of the failure of a single element in the monitored system. Additionally, the reliability standards require SPP to maintain the region's bulk electric system within certain reliable operating limits. If the proposed CPP remains as is, the bulk electric system will be at serious risk of violating these limits. The likelihood that this outcome occurs dramatically increases if the timing of the issuance of the final rule effectively prevents the construction of electric system infrastructure necessary to facilitate compliance with the state goals being contemplated under the proposed CPP.

Because maintaining reliability is SPP's most important function, it has completed an assessment of the impacts that the proposed CPP will have on reliability in the SPP region. This assessment includes an evaluation of transmission system impacts and an evaluation of impacts to reserve margin. In both evaluations, SPP modeled EPA's projected Electric Utility Generating Unit ("EGU") retirements within the SPP region and surrounding areas (see Figure 1 below).

[2] Up to $1 million per day, per violation.

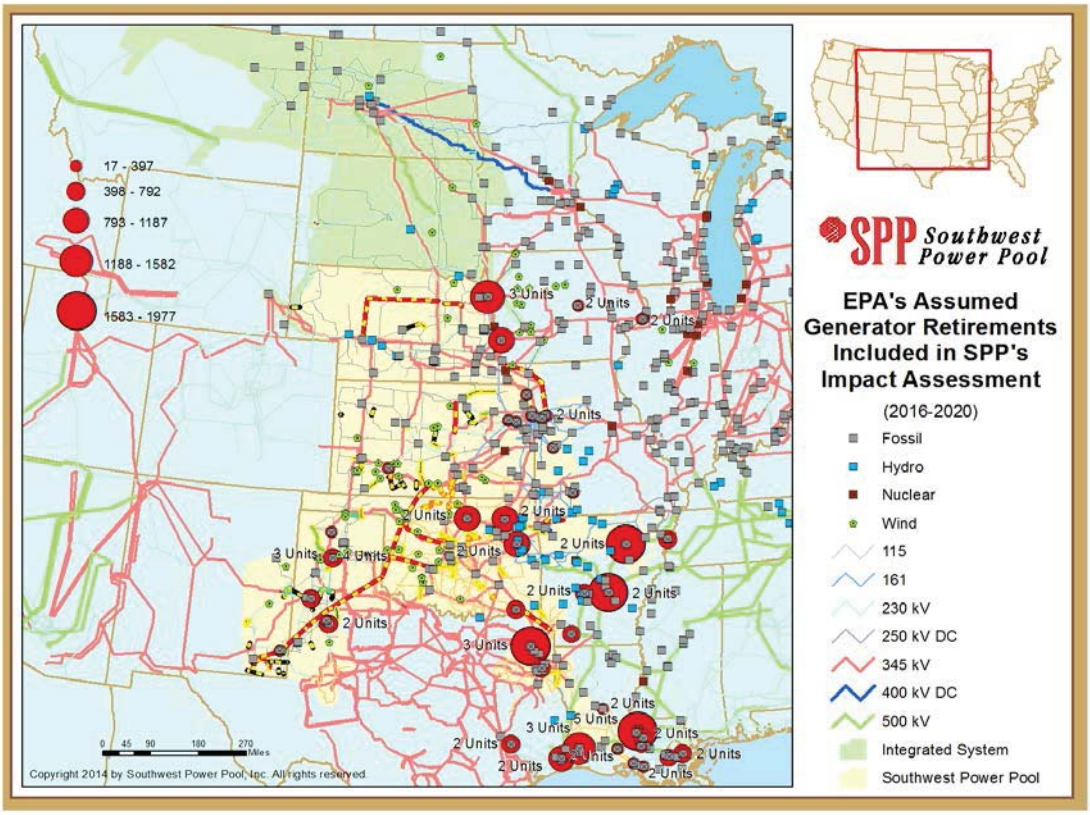

Figure 1: EPA's Projected EGU Retirements by 2020 in the SPP Region and Adjacent Systems

The transmission system impact evaluation was completed in two parts. In the first part, SPP assumed available unused electric generation capacity that currently exists within the SPP region and surrounding areas would be used to replace the projected retired capacity. This scenario is a reflection of what will occur early in the EPA's proposed compliance period where carbon emissions are expected to be drastically reduced but there is insufficient time to make changes to generation and transmission infrastructure or develop other alternatives.

The second part of the transmission system impact evaluation assumed that the projected EGU retirements would be replaced by increased output of existing generation, including wind resources, and new generation capacity modeled according to resource planning information being utilized in SPP's 10-year transmission planning assessment that is currently in progress (see Figure 2 below).

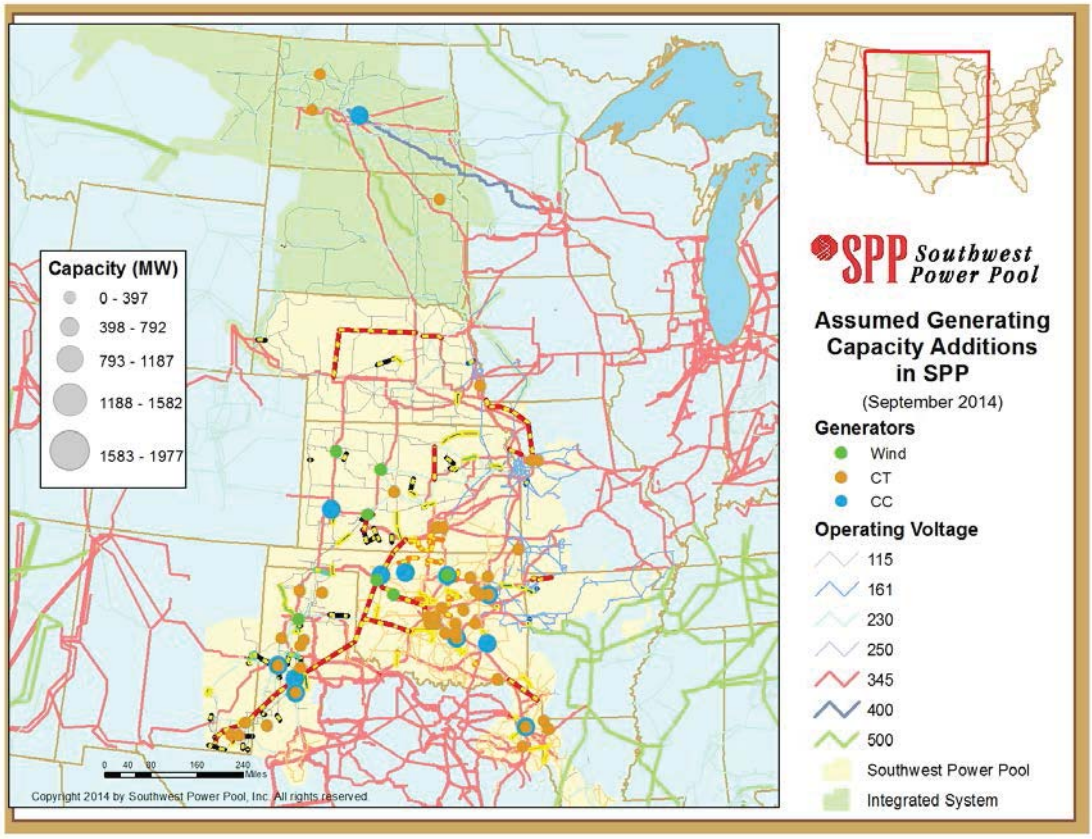

Figure 2: New Generation Capacity Assumed in Part 2 of System Impact Evaluation

This part of the evaluation is not intended to address whether it is possible to install replacement generation capacity in a timely fashion under the proposed CPP compliance timeframe, nor is it intended to suggest locations where replacement generation should be located.

The SPP region will experience numerous thermal overloads and low voltage occurrences under both scenarios studied. Results of the first part of the transmission system impact evaluation indicate that if the assumed EGU retirements were to occur absent requisite transmission and generation infrastructure improvements, the power grid would suffer extreme reactive deficiencies (see Figure 3) that would expose it to widespread reliability risks resulting in significant loss of load and violations of NERC reliability standards.

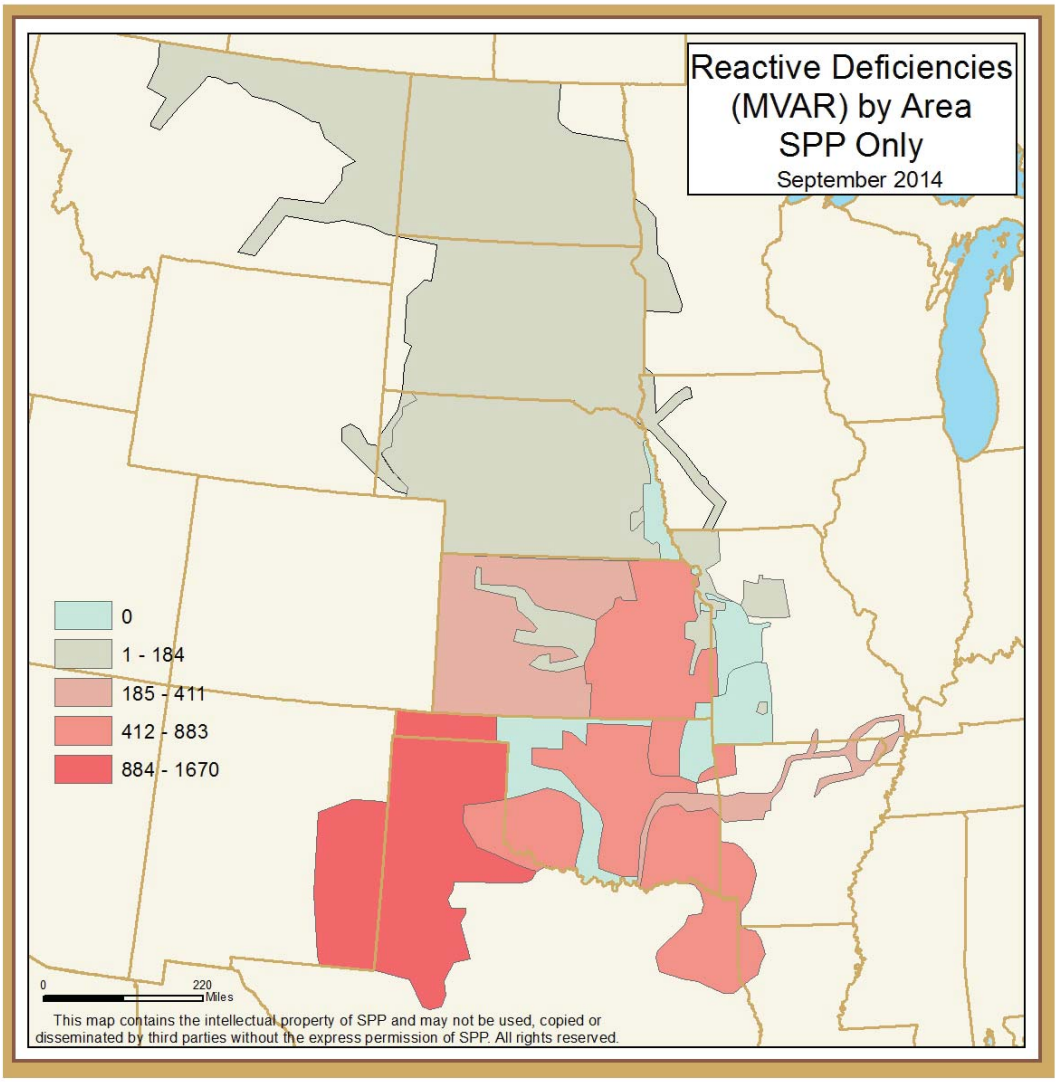

Figure 3: Transmission System Impact Analysis Part 1 - Reactive Deficiencies (MVAR)

Results of the second part of the evaluation indicate that even with generation capacity added to replace the assumed EGU retirements, additional transmission infrastructure will be needed to maintain reliable operation of the grid. This assessment revealed 38 overloaded elements that SPP would be required to mitigate with transmission planning solutions. These overloaded elements were identified in the portions of six states – Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas – that operate within the SPP region. Portions of the system in the Texas panhandle, western Kansas, and northern Arkansas were so severely

overloaded that cascading outages and voltage collapse would occur and would result in violations of NERC reliability standards. The following graph shows the number of overloaded elements and significance of loading expected under the conditions studied in this assessment (see Figure 4 below).

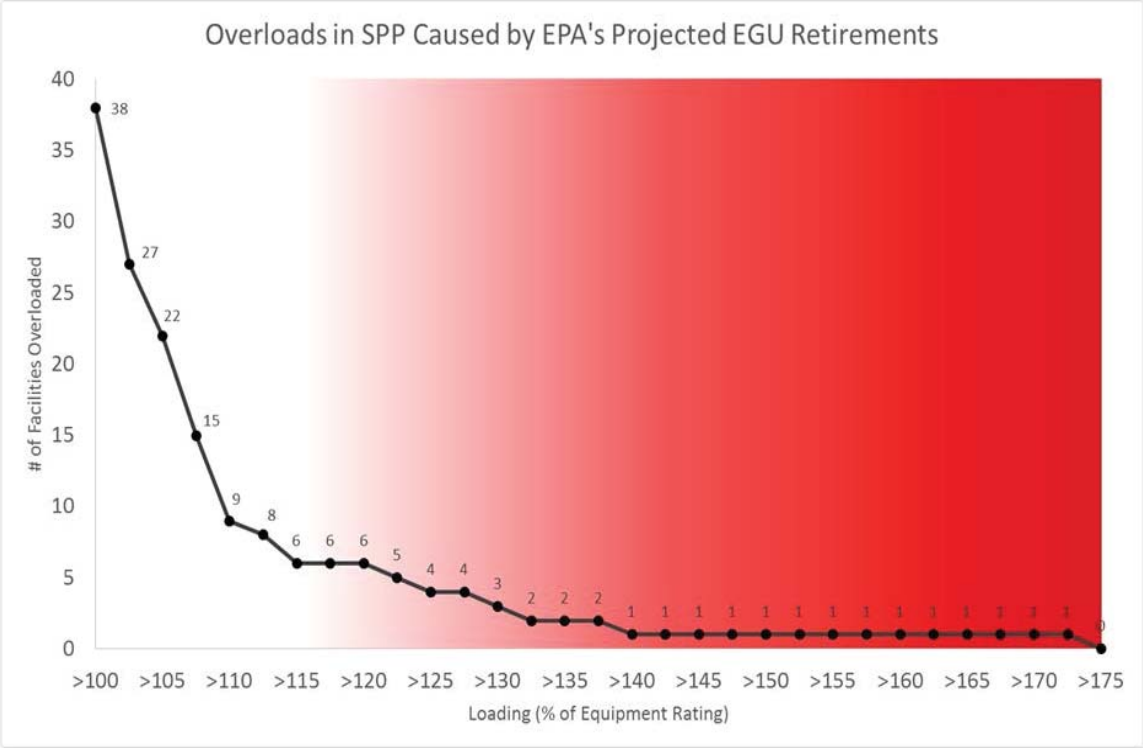

Figure 4: Number of Facilities Overloaded in Part 2 of System Impact Evaluation

Both parts of the assessment assumed that electric transmission expansion currently planned to meet previously identified needs would be available. It is important to note that the transmission expansion currently planned in SPP does not consider EGU retirements expected as a result of the CPP. EPA's projected EGU retirements represent approximately 6,000 MW of additional capacity being retired in the SPP region beyond that currently expected by 2020. This represents approximately a 200% increase in retired generating capacity compared to SPP's current expectations. Unless the proposed CPP is modified significantly, SPP's transmission system impact evaluation indicates serious, detrimental impacts on the reliable operation of the bulk electric system in the SPP region, introducing the very real possibility of rolling blackouts or cascading outages that will have significant impacts on human health, public safety and economic activity within the region.

SPP also performed an evaluation of the impacts of the projected EGU retirements on SPP's reserve margin. Reserve margin is the amount of generation capacity an entity maintains in excess of its peak load-serving obligation. SPP's minimum required reserve margin is 13.6% per load-serving entity. In this evaluation, SPP utilized current load forecasts, firm capacity purchases and sales, currently planned generator retirements and additions, as well as the additional generator retirements projected by the proposed CPP. This evaluation concluded that by 2020, SPP's reserve margin would fall to 4.7%, which is 8.9% below SPP's minimum reserve margin requirement and would result in a violation of SPP's reliability criteria and NERC reliability standards. Out of the fourteen load-serving members impacted by the EPA's projected EGU retirements, nine would be deficient in 2020. Furthermore, SPP found that its anticipated reserve margin would fall to -4.0% by 2024, causing ten of SPP's load-serving members to be deficient (see Figure 5 below).

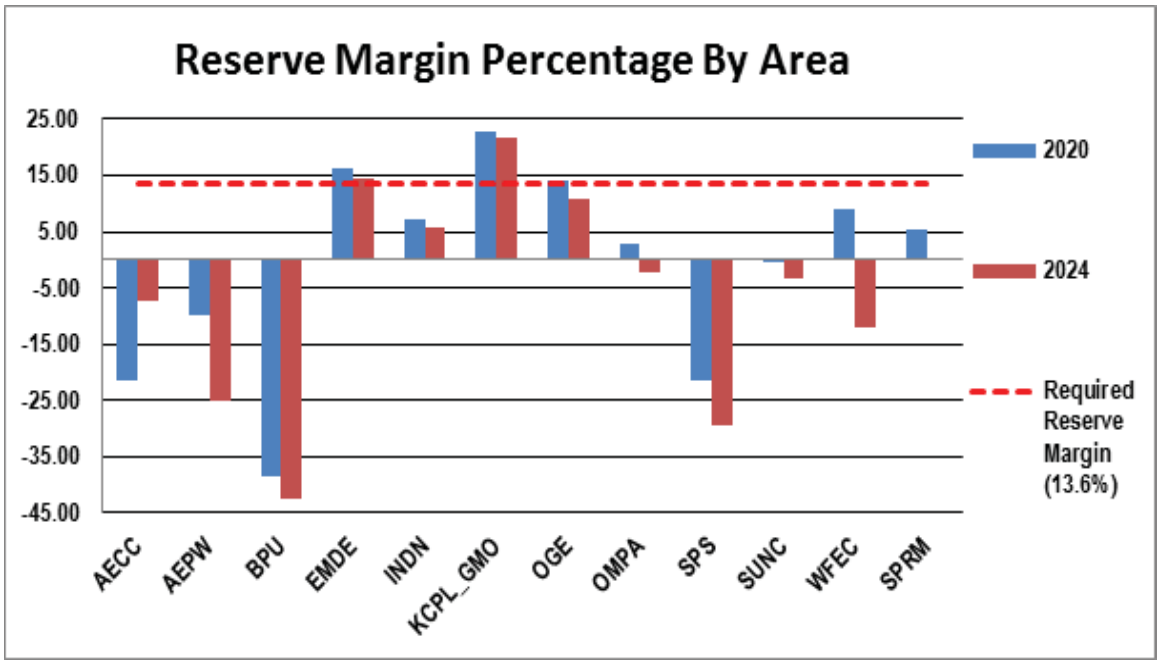

Figure 5: Reserve Margin Percentage by Area

These anticipated reserve margins represent a total generation capacity deficiency in the SPP region of approximately 4,600 MW in 2020 and 10,100 MW in 2024.

Based on SPP's reliability impact assessment, it is clear that the proposed CPP will impede reliable operation of the electric transmission grid in the SPP region, resulting in violations of NERC's mandatory reliability standards and exposing the power grid to significant interruption or loss of load.

SPP has only been able to perform an initial reliability evaluation of steady-state system response during a "normal" future summer peak condition. SPP has not evaluated the impact of the proposed EGU retirements during other potentially critical scenarios, such as drought and polar vortex conditions or times of limited wind resource availability, which have been experienced numerous times within SPP's region in recent history.

Furthermore, there has been inadequate time to perform analysis of the technical feasibility of each of the four building blocks proposed within the CPP. To be clear, if any or all of the four building blocks are not feasible, application of a goal that assumes they are will have untold consequences on the reliability of the bulk electric system. For example, if the projected EGU retirements occur and a 70% capacity factor from natural gas combined cycle generating units, as assumed in CPP building block 2, is not feasible, the reliability implications of this improper assumption will be very significant and serious. Additional time to evaluate the impact of these and other potential concerns on reliability of the bulk electric system is warranted before imposing a final rule that is not properly considerate of potential threats to the reliability of the bulk electric system.

SPP is also concerned with the timing proposed for compliance with the CPP. Within the SPP region, the timing associated with CPP compliance is problematic at best. Based on SPP's review of the proposed CPP, EPA has considered neither the cost nor the time required to plan and construct electric transmission facilities. In the SPP region, as much as eight and a half years to study, plan for and construct new transmission facilities has been required. Compliance with the proposed CPP is impossible due to the transmission expansion that will be required and the time it takes to complete the required transmission expansion. In addition to more time being needed to develop plans for and construction of necessary infrastructure, a "reliability safety valve", as suggested by the ISO/RTO Council prior to release of the proposed CPP, should be incorporated into the final rule. Such an approach would require that state plans include a process to evaluate electric system reliability issues resulting from implementation of the state plan and require mitigation when needed.[3]

Furthermore, while the proposed CPP provides states with significant flexibility for compliance, EPA has not provided state air quality and economic regulators with sufficient time to take advantage of this flexibility. As a consequence, SPP anticipates there will be few, if any, submitted compliance plans that reflect the regional nature of transmission planning, wholesale energy markets or, in the SPP

[3] *EPA CO2 Rule—ISO/RTO Council Reliability Safety Valve and Regional Compliance Measurement and Proposals;* ISO/RTO Council at http://www.isorto.org/Documents/Report/20140128_IRCProposal-ReliabilitySafetyValve-RegionalComplianceMeasurement_EPA-C02Rule.pdf; January 28, 2014.

region, transmission cost allocation. None of these issues are currently addressed on a state-specific basis within SPP, but rather are addressed regionally in a transparent environment where state boundaries are not acknowledged since the grid crosses city, county and state boundaries.

The proposed CPP will change the market dispatch of generating units by reducing the availability of the most economic generating resources. Such a shift will cause higher market clearing prices in the SPP region resulting in material adverse economic impacts on SPP customers. The proposed CPP will increase reliance on renewables and generators fueled by natural gas, yet there has been no evaluation of additional operating and planning measures needed to support integration of significant additional renewables and of natural gas availability required to fuel the increased number of gas burning units in the SPP region. While SPP's members will likely dramatically increase their reliance on wind generation within the SPP region to meet carbon emission goals under the proposed CPP, a proportional increase in gas burning generators will be necessary during times when wind resources are not available to maintain reliable energy supplies and minimum required planning reserves.

The current electric power grid has evolved incrementally over the last 40-plus years to provide a reliable supply of power in support of the current mix of generation assets. The changes being proposed by the EPA in the proposed timeframe will dramatically change use of the current system and will need to be thoroughly evaluated, modified as necessary, and implemented in a timely and responsible manner to avoid imposition of unnecessarily high costs and reliability risks to customers. The EPA should work closely with the regions, the states and all interested parties to ensure that any final CO_2 rule maintains bulk electric system reliability compatible with a reliable, efficient market dispatch of available generation.

As a result of its concerns, SPP recommends the following:

(1) A series of technical conferences jointly sponsored by FERC and the EPA. The topics that should be discussed at these conferences include impacts of the proposed CPP on power system reliability, impacts on regional markets, and how to move forward in a coordinated fashion that best facilitates accomplishment of both EPA and FERC objectives.

(2) Completion of a detailed, comprehensive and independent analysis of the impacts the proposed CPP will have on the reliability of the nation's bulk electric system. This analysis should take place in an open and transparent manner and should be completed before final rules are adopted by the EPA.

(3) Extension of the proposed schedule for compliance in order for the necessary electric transmission, electric generation, and gas pipeline infrastructure to be identified and constructed within and across the appropriate planning areas. At a minimum, the imposition of the proposed interim goals beginning in 2020 should be extended at least five years. Extending the schedule for compliance will help states develop plans that are achievable and acceptable to the EPA, reduce risks of reliability impacts and violations of reliability standards, and increase the possibility that states will be able to take a regional approach that reflects market realities, and how transmission is planned and paid for.

(4) Adoption of the "reliability safety valve" as proposed by the ISO/RTO Council.

I appreciate your prompt attention to these concerns. Please contact me if you have any questions or would like to discuss this matter further.

Respectfully submitted,

Nicholas A. Brown
President & CEO
Southwest Power Pool, Inc.
(501) 614-3213 · nbrown@spp.org

cc: SPP Board of Directors
SPP Regional State Committee
SPP Strategic Planning Committee
SPP Regional Entity Trustees

SPP'S RELIABILITY IMPACT ASSESSMENT
OF THE EPA'S PROPOSED CLEAN POWER PLAN

Background[1]

In its recently released proposed Clean Power Plan (CPP) rule, the U.S. Environmental Protection Agency (EPA) proposes to cut existing power plant carbon emissions 30% by the year 2030, from 2005 levels. As currently proposed, the CPP will be implemented through state-developed plans that meet state-specific carbon reduction goals set by the EPA. The CPP offers flexibility for states to rely on a number of options to meet those goals, including generator efficiency improvements, redispatch from coal to gas fueled generation, increased reliance on renewable resources, and increased energy efficiency. State plans will be required as early as 2016 but may be deferred until 2018 subject to collaborative approaches and regional solutions. The EPA's state-specific carbon reduction goals are proposed to be effective beginning in 2020. Based on its modeling and assessment of the proposed CPP, the EPA has projected generator retirements; Figure 1 shows projected generation retirements in the Southwest Power Pool (SPP) region and adjacent systems according to EPA's Integrated Planning Model (IPM) Option 1 simulation.

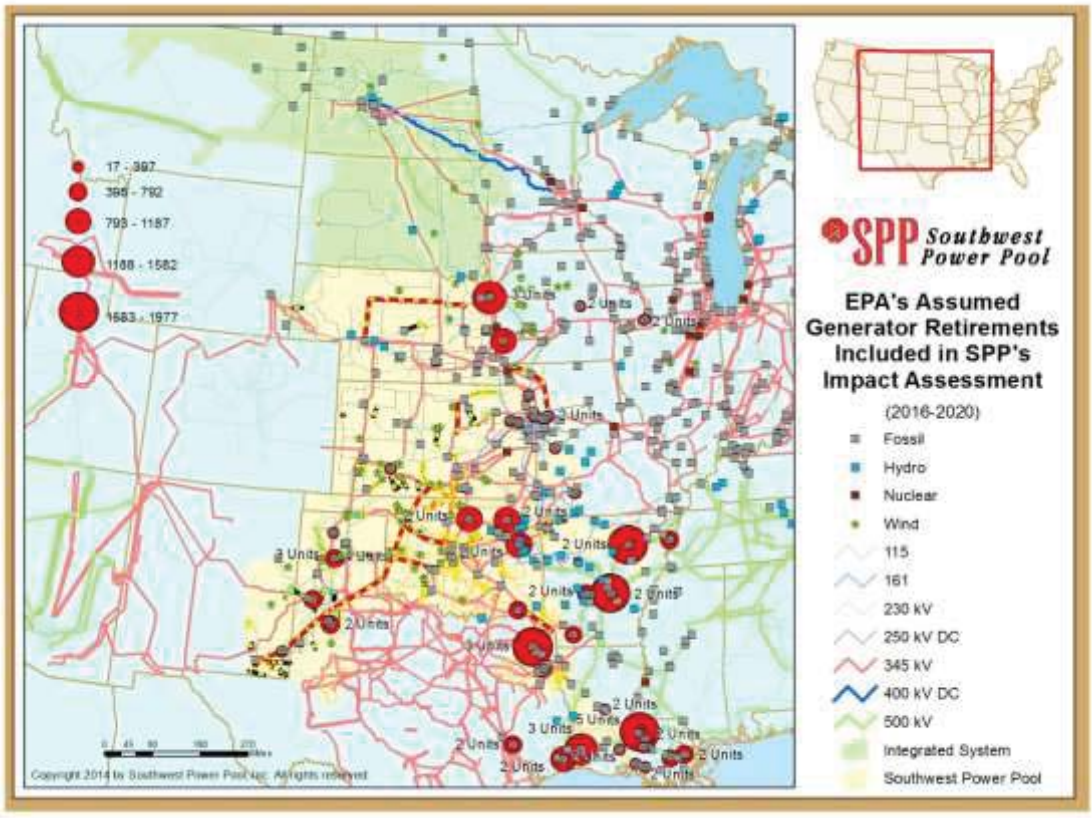

Figure 1: EPA's Projected EGU Retirements by 2020 in the SPP Region and Adjacent Systems

[1] For purposes of this assessment, SPP has included the Integrated Systems utilities, which are in the process of joining the organization.

The EPA IPM assumptions for SPP includes retirements of approximately 9,000 MW of capacity associated with existing coal and gas-fired units currently relied upon to serve load obligations in the SPP region. EPA's projected Electric Generating Unit (EGU) retirements represent approximately 6,000 MW of additional capacity being retired in the SPP region beyond that currently expected by 2020. The EPA projections represent approximately a 200% increase in retired generating capacity compared to SPP's current expectations.

Scope of Work

The scope of this reliability impact assessment (Assessment) reflects input from member representatives under the guidance of SPP's Strategic Planning Committee and other stakeholders. This is a cursory analysis to help inform comments that are to be submitted to the EPA on the draft rule by December 1, 2014.

This Assessment evaluates the impacts of the EPA's projected EGU retirements within SPP and adjacent areas on reliability of the bulk power system within the SPP region. Reliability impacts were evaluated by identifying bulk power system equipment overloads and low voltages both during system intact conditions and during loss of a single element (Transmission System Impact Analysis) and by determining impacts to SPP's reserve margin (Resource Adequacy Analysis). SPP evaluated the impacts of the EGU retirements projected by the EPA that result from implementation of the carbon emission reduction goals proposed in CPP, but due to time constraints did not evaluate the viability or reliability impacts of any of the building blocks used to establish those proposed goals.

Transmission System Impact Analysis (TSIA)

Method

SPP staff developed power grid models to assess how compliance with the proposed CPP would impact reliability in the SPP region. The TSIA incorporated the retirements reflected by EPA in their IPM models based on the Option 1 State simulation for 2020.

Part 1 of the TSIA assumed the retired capacity would be replaced by existing unused capacity remaining within the SPP footprint and surrounding areas. Part 2 of the TSIA assumed the retired capacity would be replaced by a combination of existing unused capacity and new gas-fired and wind resources in the SPP footprint as needed to address capacity deficiencies. Both parts include performance of steady-state power flow analyses using models developed as described below to evaluate transmission system performance when all transmission elements are in service ("system intact") and during conditions after which any single transmission element, including a generator, is taken out of service ("first contingency" or "N-1").

Assumptions

Part 1 of the TSIA was performed using a current 10-year-out summer peak model modified to reflect EPA's projected retirements in the SPP region and surrounding areas. Reactive power limits on remaining generators were increased as necessary to enable a minimally solvable power flow model under system intact conditions and to account for reactive power shortfalls within SPP.

Part 2 of the TSIA was performed using an updated 10-year-out summer peak model modified to reflect EPA's projected retirements in the SPP region and surrounding areas. Additionally, new gas-fired and

wind generators (see Figure 2) were added within SPP's region and dispatched to offset the majority of the EPA retirements. The generators added to the model were placed in locations based on resource plans developed to support SPP's 10-year transmission planning evaluation. New gas generators, including combined cycle (CC) and combustion turbine (CT), were dispatched at approximately 5,600 MW and new wind generators were dispatched at approximately 300 MW in SPP's model. Wind generation levels at existing plants in SPP were increased by approximately 3000 MW to serve load in SPP and support 2000 MW of transfers from SPP to adjacent areas in Arkansas and Louisiana that would be capacity deficient based on the EPA projected retirements. Additionally, wind resources in MISO were increased to provide 2000 MW of transfers from MISO to these same deficient regions in Arkansas and Louisiana.

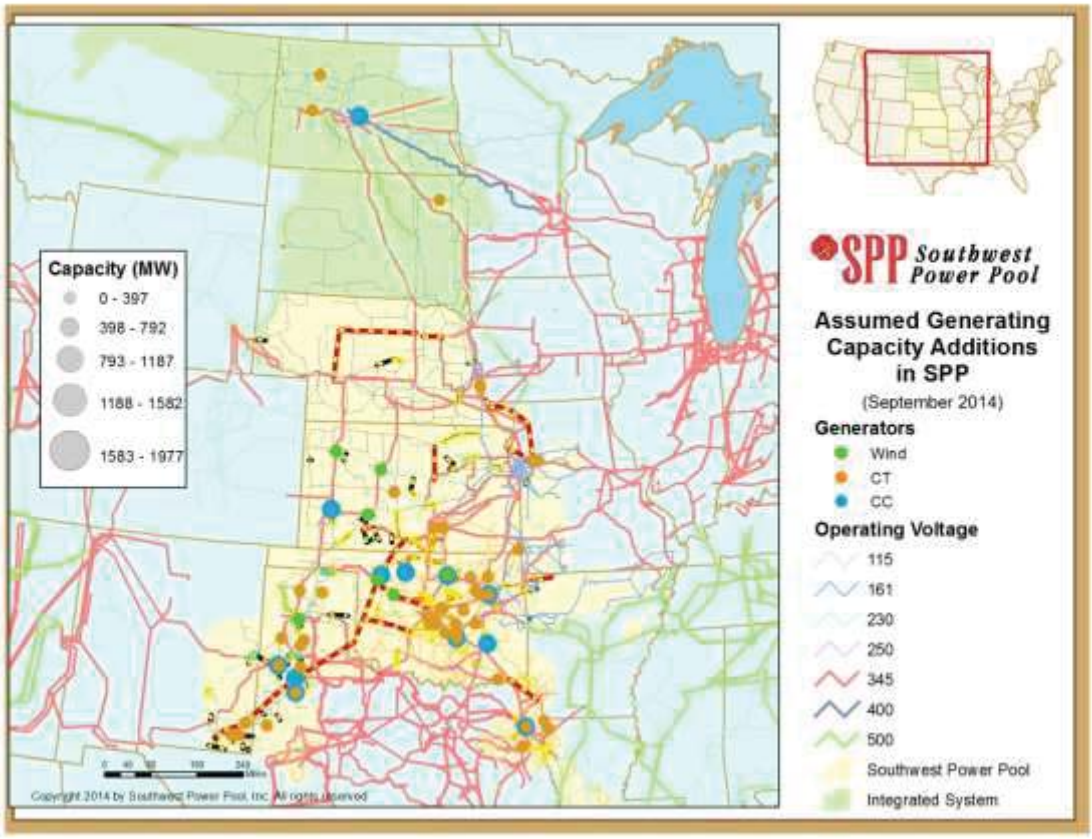

Figure 2: New Generation Capacity Included in Part 2 of the TSIA

TSIA Reliability Findings

Both parts of the TSIA identified significant reliability issues. The issues were not mitigated, but actually increased, despite the optimal generation expansion and conservative assumptions used in Part 2 to address EPA retirements.

TSIA Part 1

Results from the power flow analysis performed in Part 1 of the TSIA were initially indeterminate under both system intact and first contingency conditions. As a result of the assumed EPA retirements with no resource additions, the SPP network was so severely stressed by large reactive deficiencies that the software used in the analysis was unable to produce meaningful results, which is generally indicative of voltage collapse and blackout conditions. In order to enable analytical results, SPP modeled increased reactive limits at remaining generators on the system and was eventually able to achieve analytical results by adding approximately 5,200 MVAR of reactive production to the model during system intact conditions. Because of the arbitrary nature of artificially increasing reactive limits of generators, reliability indicators such as equipment loadings and voltage levels are not accurate and are not presented in this Report. However, this analysis indicates approximately 5,200 MVAR of reactive deficiencies in the SPP footprint during system intact conditions resulting from the modeled EPA generator retirements. Figure 3 shows the reactive power deficiencies within SPP identified by this analysis. The most notable deficiencies were found in Texas and eastern Oklahoma.

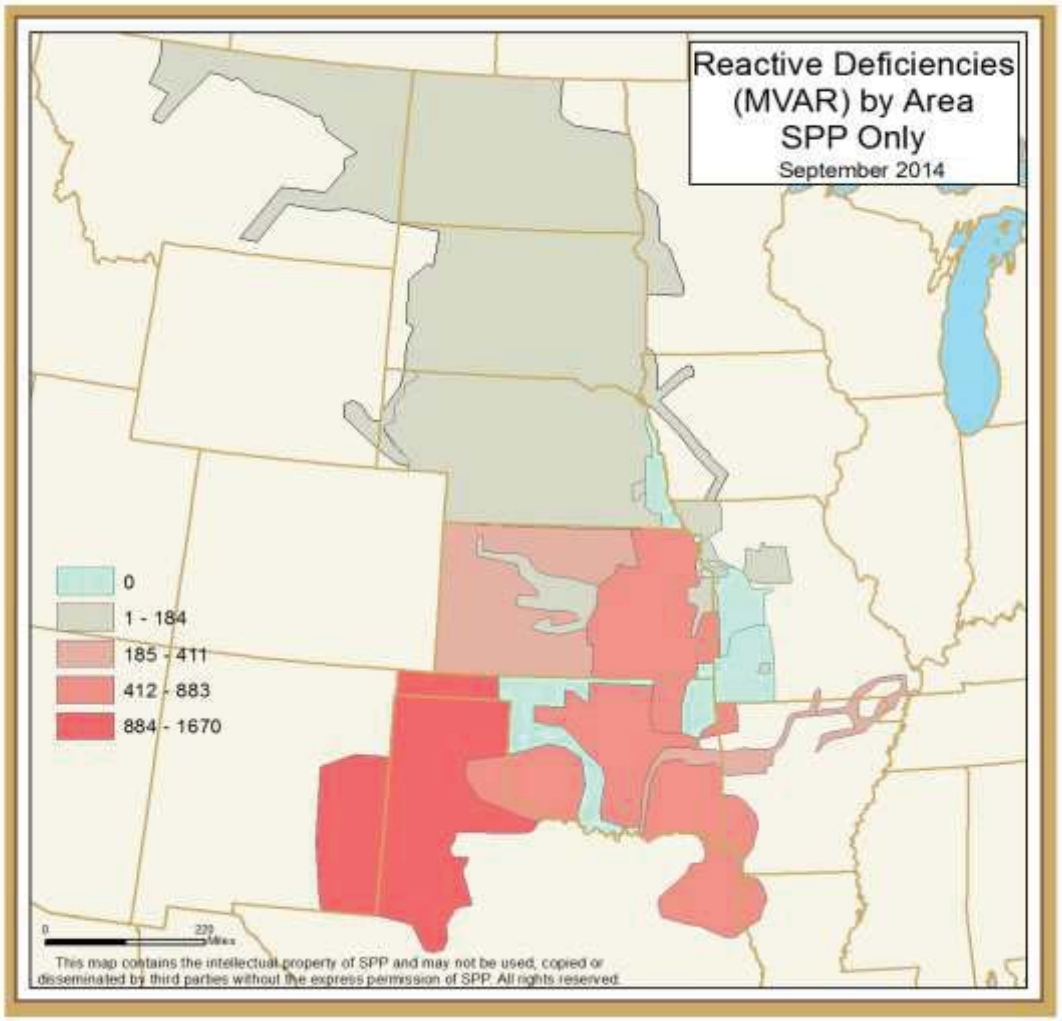

Figure 3: Transmission System Impact Analysis Part 1 - Reactive Deficiencies (MVAR)

TSIA Part 2

Part 2 of the TSIA utilized the latest optimal generation resource plans available to SPP as well as existing wind resources to mitigate generation shortfalls within SPP. Existing wind generation in SPP and the northern part of MISO were increased to serve shortfalls in the southern part of MISO. An N-1 assessment revealed 38 overloaded elements. These overloaded elements were identified in the portions of six states – Arkansas, Kansas, Louisiana, Missouri, Oklahoma, and Texas – that operate within the SPP region. Portions of the system in the Texas panhandle, western Kansas, and northern Arkansas were so severely overloaded that cascading outages and voltage collapse would occur. The following graph (Figure 4) shows the number of overloaded elements and significance of loading expected given the EPA retirements from the proposed CPP and substantial new gas-fired and wind generation additions:

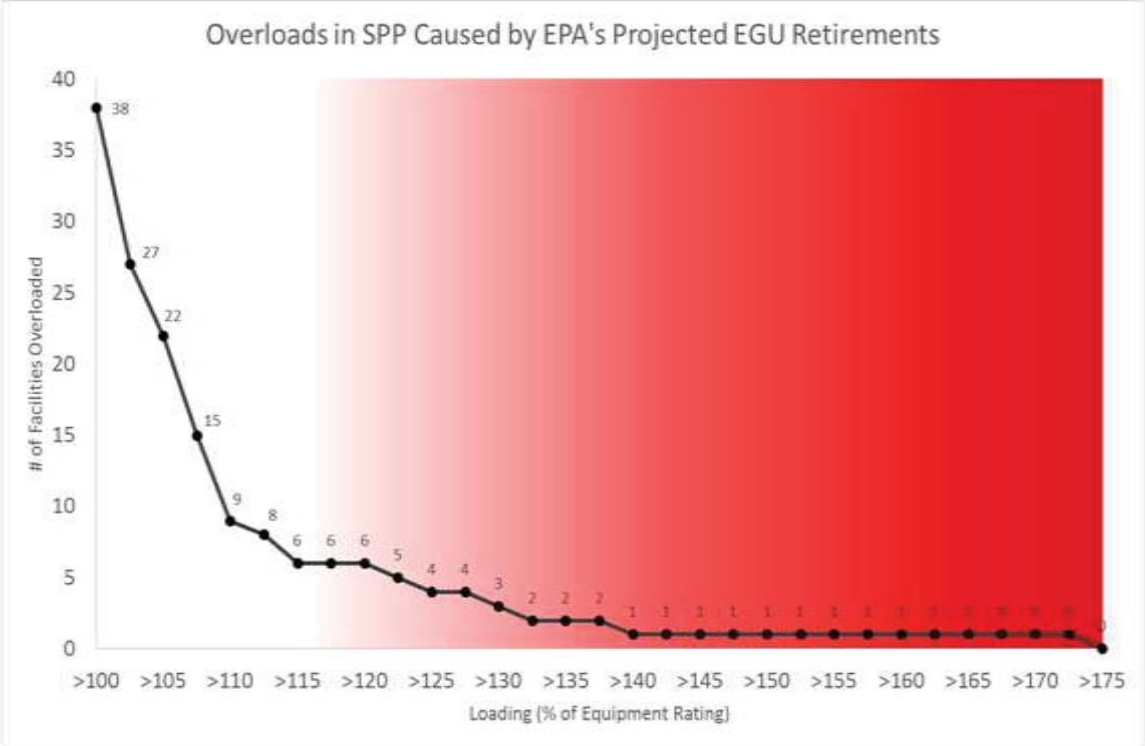

Figure 4: Number of Incremental Overloads in Part 2 of the TSIA

Both parts of the assessment assumed that electric transmission expansion currently planned to meet previously identified needs would be available. It is important to note that the transmission expansion currently planned in SPP does not consider EGU retirements expected as a result of the CPP.

Resource Adequacy Analysis

Resource adequacy is a fundamental requirement for a secure power system and is often measured in terms of reserve margin. The Assessment evaluated the impacts of the projected EGU retirements on SPP's reserve margin. SPP has a minimum reserve margin requirement of 13.6% that every SPP member with load serving responsibilities must plan to meet with appropriate generation capacity. In evaluating the impacts of the projected EGU retirements on SPP's reserve margin, SPP utilized current

load forecasts, currently planned generator retirements and additions, as well as the retirements projected by the EPA. The Assessment showed that by 2020, SPP's reserve margin would fall to 4.7%, which is 8.9% below our minimum reserve margin requirement. Out of SPP's fourteen load-serving members impacted by the EPA's projected retirements, nine would be deficient in 2020. Furthermore, SPP found that its anticipated reserve margin would fall to -4.0% in 2024, increasing the number of deficient load serving entities to ten. These anticipated reserve margins represent a generation capacity deficiency of approximately 4.6 GW in 2020 and 10.1 GW in 2024.

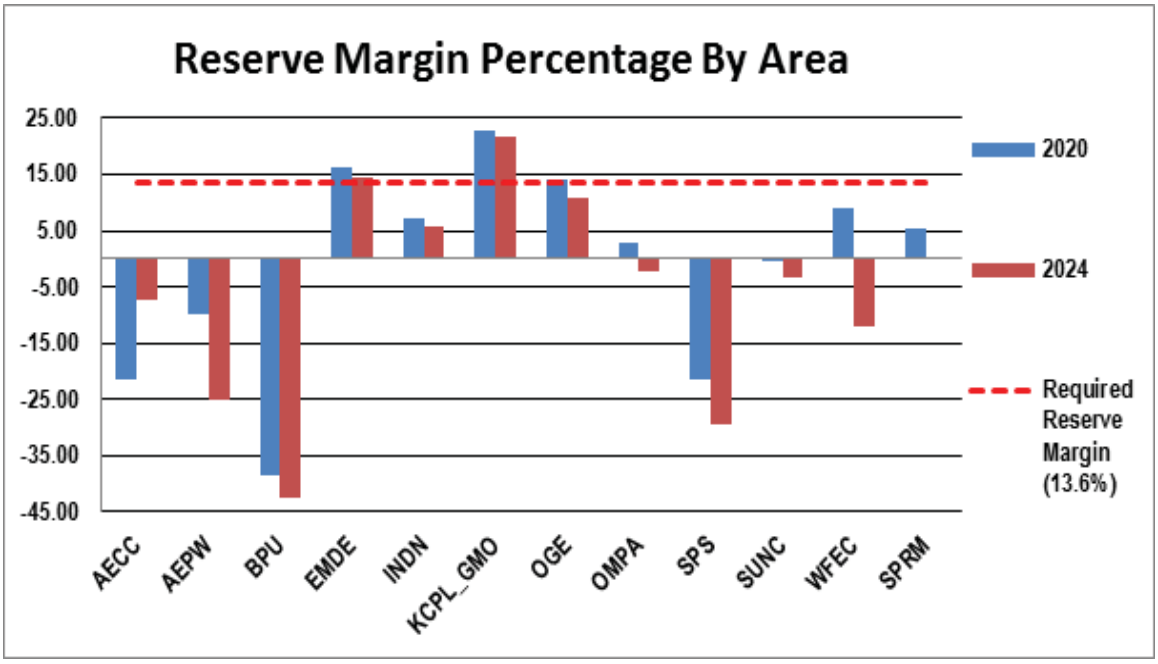

Figure 5: Reserve Margin Percentage by Area

Conclusions

Development of a stable, secure, efficient and effective bulk electric power system takes time. Disruptive changes such as retirements, retrofits and/or changes in the operating characteristics of base load resources, must be considered carefully and communicated clearly in a transparent and open process.

The findings in this Assessment make it very clear that new generation and transmission expansion will be necessary to maintain reliability during summer peak conditions if EPA's projected generator retirements occur. Even the scenario that assumes optimal resource expansion using new natural gas fired resources could be problematic during extreme winter load conditions with gas supply and delivery challenges. This Assessment does not consider outages to accommodate retrofits/cut-ins, time and efforts to get new replacement thermal capacity approved, and in service to offset capacity losses or transmission upgrades to maintain system reliability. More comprehensive planning efforts with stakeholders and new tools/metrics will be required. Unprecedented coordination and cooperation beyond regional planning efforts will be necessary, but may not be timely given significant challenges with interregional planning and necessary system expansion. In addition, broader system assessments of the bulk power system, and natural gas pipeline and storage systems based on environmental constraints will be required.

Implementation of approved state plans will take time, as will potential mitigation measures to address unacceptable system conditions to accommodate retirements, and/or retrofits to existing plants, which are the major resources that drove the design of the current bulk power system. Outages to accommodate cut-ins of new equipment, as well as shifts in the operating characteristics of existing base load units to more seasonal dispatch could have a profound impact on system reliability.