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TO KEEP THE LIGHTS ON... TODAY AND IN THE FUTURE

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Nicholas A. Brown, President & CEO

**VIA ELECTRONIC SUBMISSION AND FIRST CLASS MAIL**

July 19, 2011

Water Docket  
U.S. Environmental Protection Agency  
Mail Code: 4203M  
1200 Pennsylvania Ave., NW  
Washington, DC 20460

EPA Docket Center  
U.S. Environmental Protection Agency  
Mail Code: 2822T  
1200 Pennsylvania Ave., NW  
Washington, DC 20460

Re: National Pollutant Discharge Elimination System – Cooling Water Intake Structures at Existing Facilities and Phase I Facilities; Docket ID No. EPA-HQ-OW-2008-0667

National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units; Docket ID Nos. EPA-HQ-OAR-2009-0234 and EPA-HQ-OAR-2011-0044

Dear Sir or Madam:

Southwest Power Pool, Inc. (SPP) appreciates the opportunity to comment and respectfully submits the attached report entitled, "Review of the Potential Reliability Impacts of Proposed EPA Regulations Impacting Generation in the SPP Footprint", dated July 19, 2011, in response to the U.S. Environmental Protection Agency's (EPA) proposed rules issued in the above-captioned dockets. SPP's preliminary assessment is based on a similar study performed by ERCOT which found comparable results. SPP's cursory analyses identify substantial reliability and cost impacts under credible scenarios with extremely conservative inputs and assumptions, particularly in light of the recently released EPA Cross-State Air Pollution Rule (CSAPR) which was not considered in this assessment.

SPP is an Arkansas non-profit corporation with its principal place of business at 415 N. McKinley, Suite 140, Little Rock, Arkansas 72205. Currently, SPP has 64 members serving approximately 15 million customers in a 370,000 square mile service territory covering all or part of the following states: Arkansas, Missouri, Kansas, Oklahoma, Louisiana, Mississippi, Nebraska, New Mexico and Texas. SPP's members include investor-owned utilities, municipals, cooperatives, state authorities, independent power producers, power marketers, independent transmission companies, as well as a contract participant. SPP is a Federal Energy Regulatory Commission (FERC) approved Regional Transmission Organization (RTO) and administers open-access transmission services across the SPP region under the terms of SPP's Open Access Transmission Tariff. As an RTO, SPP plans for and



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functionally controls the transmission infrastructure committed to it and administers a competitive real-time wholesale electricity marketplace.

As outlined in the paragraphs that follow, SPP is concerned that the timeframe for implementation of the proposed rules may not provide generator operators sufficient time to bring their facilities into compliance, and they would be prohibited from operating until compliance activities can be completed. Should this occur, threats to the reliable operation of the grid will occur.

While SPP's initial assessment has focused on coal and gas units and select EPA rules similar to the ERCOT assessment, other pending requirements – carbon dioxide regulations for example – could have major impacts on future resource plans, system reliability, and economics. It is important to note this initial assessment did not consider impacts the reciprocating internal combustion engines (RICE) regulations may have on the potential loss of small units which many municipalities have relied upon. Elimination of those units could create local congestion challenges and require both transmission expansion and local programs to keep the lights on. Similarly, SPP did not consider the impact of Regional Haze requirements and the most recently published Cross-State Air Pollution Rule, which will exacerbate impacts on the system and SPP's ability to maintain adequate generating capability and reserves in the SPP footprint.

Based on this cursory assessment, which seems conservative given recent developments, it appears that EPA regulations could prevent reliable operation of the SPP RTO. Further impacts may occur, including failure to meet the requirements set forth by the North American Electric Reliability Corporation which were approved by FERC. SPP's findings and conclusions are not intended to exaggerate the system impacts, but rather to point out the possible types of adverse outcomes that may result in worst case scenarios as defined in this assessment.

SPP is concerned that the timeframe for compliance with the proposed rules, should they be approved, may be more aggressive than what can be achieved by the industry. Should this be the case it may adversely impact grid reliability due to the sudden required retirements and outages of units. At this point, SPP is aggressively monitoring several areas of its system where temporary mothballing of facilities appears possible and may lead to unstable, and hence unreliable, operating conditions. SPP encourages the EPA to work with generation owners to develop flexible compliance schedules to ensure equipment installation is completed in a timely, safe, reliable and cost-effective manner without an arbitrary deadline. Compliance plans developed in a collaborative manner may lessen the negative impact and/or prevent the unavailability of labor, parts, and other resources that may result from an arbitrary deadline. Such an approach would also ease concerns over grid instability caused by mass outages on generators to install the required equipment.

Furthermore, SPP is concerned that sufficient time will not be available to complete transmission construction activities necessary to mitigate the prohibited operation of certain generators and to complete the construction of replacement resources. As SPP becomes aware of units removed from service due to compliance with these new regulations, it will work diligently to plan and direct the transmission construction necessary to mitigate any resulting reliability issues on the SPP transmission system. However, as Transmission Customers within the region remove units from service and secure new replacement capacity, SPP is concerned as to the uncertainty of being able to identify the needed upgrades and place those new lines in service. SPP is responsible for overseeing the reliable operation of the SPP transmission system and is concerned that, in the event SPP is unable to construct the necessary lines in time and units are unable to operate due to these additional EPA restrictions, the SPP



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transmission system may be placed in an unreliable operating state or one that necessitates firm load curtailments/customer outages.

As a result of these concerns, SPP has two specific recommendations:

- First, SPP recommends that the EPA provide a gradual compliance schedule that allows the industry time to meet the proposed requirements in a reliable, safe and economic manner. Working with the industry to institute these changes will help preserve reliable system operations and also allow for a more gradual integration of the costs of compliance that could significantly mitigate reliability issues and sudden increases in consumer electricity prices.
- Second, SPP recommends that the EPA include in its rules a temporary waiver mechanism under which the affected generator owner, could seek an extension to allow for the continued operation of a generator while solutions, such as transmission expansion or demand response programs, can be assessed and approved by SPP and other transmission service providers.

Although these recommendations are based solely upon SPP's initial assessment, they appear to be prudent under any foreseeable conditions that may occur.

Please do not hesitate to contact me should you have questions or would like to request additional information.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read "Nick Brown", is written over the typed name.

Nicholas A. Brown  
President & CEO  
(501) 614-3213 • Fax: (501) 664-9553 • nbrown@spp.org

cc: SPP Board of Director, Members Committee, Strategic Planning Committee  
State Regulators and Federal Legislators in AR, KS, LA, MO, MS, NE, NM, OK, and TX

# Review of the Potential Reliability Impacts of Proposed EPA Regulations Impacting Generation in the SPP Footprint

July 19, 2011

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## Introduction

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During its May 5-6, 2011 meeting, the Strategic Planning Committee directed SPP staff to conduct an independent study to assess the reliability impacts of a group of proposed Environmental Protection Agency (EPA) regulations that will potentially impact generation in the SPP footprint. As in a similar May 2011 ERCOT study, the assessment's scope is limited to the regulations identified below. Confining the impacts to a specific or proposed regulation at a specific point in time, however, is challenging.<sup>1</sup>

### **Clean Water Act – Section 316(b)**

Section 316(b) of The Clean Water Act is intended to limit entrainment and impingement that occurs during the cooling process at electrical generation facilities. The proposed rule<sup>2</sup> affects existing power plants that generate electricity and withdraw at least 2 million gallons per day of cooling water, used to dissipate waste heat. The EPA estimates that approximately 670 power plants will be affected, although some facilities may already employ technologies that comply with proposed impingement requirements.<sup>3</sup> Comments are due on or before July 19, 2011, and a final rule is expected in July 2012 with commensurate compliance beginning in eight years.

### **Clean Air Act – HAP Rule**

The EPA-proposed mercury and air toxics standards consist of national emissions standards for hazardous air pollutants (HAP) from coal- and oil-fired electric generating units under section 112(d) of the Clean Air Act and revised new source performance standards for fossil fuel-fired units under section 111(b) of the Clean Air Act.<sup>4</sup> These regulations apply to coal- and oil-fired electric generating units, and are expected to decrease by 91% the level of mercury these facilities currently release. Comments are due on or before August 4, 2011, and a final rule is expected in November 2011. Compliance is mandatory within three years, although an additional year may be granted.

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<sup>1</sup> Although notable, staff's assessment does not address the national emission standards for hazardous air pollutants for reciprocating internal combustion engines (RICE), which were the subject of EPA Docket ID No. EPA-HQ-OAR-2008-0708. The final RICE rule was made effective May 9, 2011.

<sup>2</sup> National Pollutant Discharge Elimination System – Cooling Water Intake Structures at Existing Facilities and Phase I Facilities, 76 Fed. Reg. 22174 (proposed April 20, 2011) (to be codified at 40 C.F.R. pts. 122 and 125).

<sup>3</sup> Answers to Common Questions about the Proposed Rule, March 28, 2011, accessed [http://water.epa.gov/lawsregs/lawguidance/cwa/316b/upload/qa\\_proposed.pdf](http://water.epa.gov/lawsregs/lawguidance/cwa/316b/upload/qa_proposed.pdf), July 1, 2011.

<sup>4</sup> National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel-Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, 76 Fed. Reg. 24976 (proposed May 3, 2011) (to be codified at 40 C.F.R. pts. 60 and 63).

## **Clean Air Transport Rule**

The Clean Air Transport Rule (CATR)<sup>5</sup>, applicable to 31 eastern states and the District of Columbia, is intended to reduce air pollution, specifically the transportation of ozone and fine particle matter across states. Originally proposed on July 6, 2010 as a replacement to the Clean Air Interstate Rule, the CATR contains two phases that would reduce nitrogen oxide (NO<sub>x</sub>) and sulfur dioxide (SO<sub>2</sub>). This rule applies to facilities with more than 25 megawatts (MW) of capacity and would impact more than half of generation units in the SPP footprint. Compliance with Phase I begins in 2012.

## **Coal Combustion Residuals Rule**

The Coal Combustion Residuals Rule<sup>6</sup> contains several alternatives for dealing with waste ash produced during the generation of electricity. Both proposals by the EPA use the Resource Conservation and Recovery Act to manage disposal of coal ash in a more stable state than current methods of impoundment. The first two methods involve federal permitting and monitoring requirements. The third allows states to interpret national permitting guidelines. According to the EPA's Regulatory Impact Analysis, over the next fifty years the first two methods could result in higher costs than the third method.

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## **Approach**

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It is unclear how these regulations will affect the industry. SPP's Integrated Transmission Plan 10 (ITP10) Scenario 2 regarding EPA rules retires most coal units less than 200 MW which aggregate to a total of 2.6 gigawatts (GW) of capacity within SPP. Earlier reports provided results ranging from 1 to 5 GW of retired capacity in the SPP footprint. Such scenarios provide a spectrum from potentially minor to moderate reliability issues in the SPP footprint.

To ensure completion of this assessment for consideration within the timeframe required, staff performed an abbreviated analysis of potential reliability impacts and utilized a number of representative reports in framing its analysis. A list of these reports is set forth below:

- *Potential Coal Plant Retirements Under Emerging Environmental Regulations*, The Brattle Group, December 8, 2010;
- *Potential Impacts of Environmental Regulation on the U.S. Generation Fleet*, Edison Electric Institute, prepared by ICF International, January 2011;
- *Review of the Potential Impacts of Proposed Environmental Regulations on the ERCOT System*, Electric Reliability Council of Texas, May 11, 2011 (ERCOT Report);

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<sup>5</sup> Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone, 75 Fed. Reg. 45210 (proposed Aug. 2, 2010) (to be codified at 40 C.F.R. pts. 51, 52, 72, 78, and 97).

<sup>6</sup> Hazardous and Solid Waste Management System; Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals from Electric Utilities, 75 Fed. Reg. 35128 (proposed June 21, 2010) (to be codified at 40 C.F.R. pts. 257, 261, 264, 265, 268, 271, and 302).



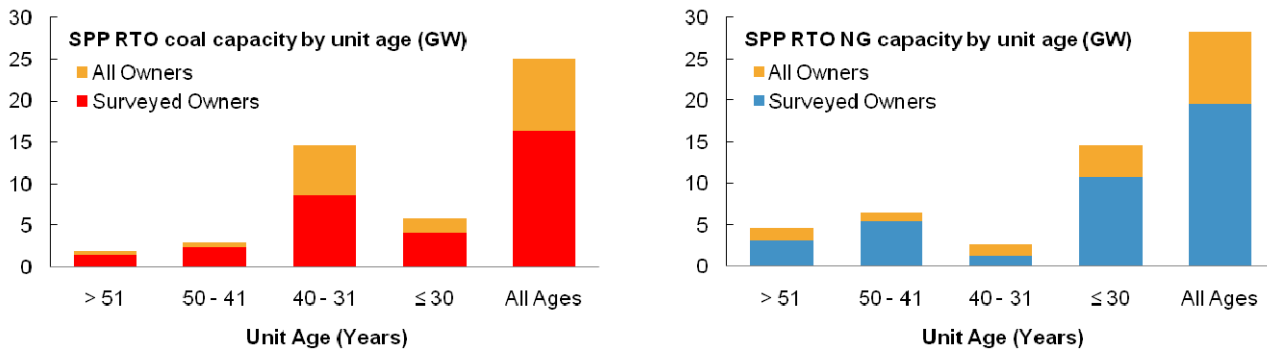
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- *U.S. Utilities: Coal-Fired Generation Is Squeezed in the Vice of EPA Regulation; Who Wins and Who Loses?*, Bernstein Research, October 2010; and
- *2010 Special Reliability Scenario Assessment: Resource Adequacy Impacts of Potential U.S. Environmental Regulations*, North American Electric Reliability Corporation, October 2010.

Additionally, staff engaged representatives of American Electric Power (AEP), City Utilities of Springfield (CUS), Kansas City Power and Light Company (KCP&L), the Omaha Public Power District (OPPD), Southwestern Public Service Company (SPS), and Westar Energy, Inc. (Westar) to discuss the specific impacts these regulations may have on their respective generators. In the discussions a survey was provided. The survey requested information, by unit, of the plans held by the generation owners.

These generation owners, who account for 68% of the total coal and natural gas (NG) capacity in the SPP RTO footprint, completed a survey providing information such as unit retirement dates, derate amounts, outage timeframes and compliance dates. When appropriate, staff considered survey data to be generally representative and extrapolated to represent all coal and gas generators in the SPP footprint. Specific calculations where this extrapolation method was utilized are noted below. Chart 1, below, compares the capacity captured in these discussions with that of the entire SPP footprint.

**Chart 1: 68% of SPP Coal and NG capacity was captured in discussions with generation owners**



Staff incorporated into its analysis the expected unit retirements and proposed retrofits of these generation sources and created four scenarios that describe the possible reliability and economic impacts: *Best Case* scenario, *Low Estimate Case* scenario, *High Estimate Case* scenario and *Worst Case* scenario.

The first scenario, referenced as the *Best Case* scenario, used only information provided by the surveyed generation owners. No extrapolation or estimation was applied in this scenario regarding the impacted capacity.

Second, to account for capacity potentially impacted by these regulations but not surveyed, staff calculated the total unit retirements provided by survey respondents compared to the total number of units owned. A percentage of 10% was found by extrapolating the total-to-retired or retrofit units that would be impacted. This scenario is referenced as the *Low Estimate Case* scenario.



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Third, to account for the spectrum of perspectives among those surveyed, further extrapolation was used solely with information from those surveyed with the highest amount of retirements and retrofits, providing a 25% scenario. This scenario is referenced as the *High Estimate Case* scenario.

In each of the above cases, 50% of the units were retired and 50% of the units were retrofitted. Surveyed generation owners are actively pursuing many detailed studies regarding the practicality and profitability of retrofitting or retiring generating units.

To account for the uncertainty surrounding this capacity, a final scenario referenced as the *Worst Case* scenario, was developed. It retires any unit currently under study and in addition to the units retired in the *High Estimate Case* scenario.

Staff considered the years 2015 and 2021 in its analysis; the former being when the HAP regulation goes into effect, and the latter being when the Clean Water Act – Section 316(b) regulation is to be in place. These dates provide important reference points that can be used to infer impacts to the SPP footprint in the intervening years. Staff acquired information about future generation capacity and total load from the U.S. Energy Information Administration (EIA) and the surveyed generation owners.

The EIA data used in this analysis included member reported wind capacity contributions, as well as demand response forecasts, in these projections. SPP members are expecting 426 MW of wind capacity contribution in 2015 and 2021, which demonstrates that SPP cannot expect significant contribution from intermittent wind resources during summer peak load conditions. In addition, SPP members are forecasting 1,200 and 1,400 MW of supply-side demand response for 2015 and 2021, respectively, that have been reflected in this analysis.

To estimate the potential cost impact of the proposed regulations on SPP generation owners, SPP prepared projections using dollar per kilowatt (kW) estimates provided in the ERCOT Report for retrofits of environmental control equipment. These expenses would be incurred if generation owners, through their ongoing analysis, determine that control equipment will be installed or upgraded to meet the regulations mitigating most of the possible retirements in the *Worst Case* scenario.

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## Reliability Outlook

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Staff calculated capacity margins for the SPP RTO footprint to determine if generation supply will be available to meet the forecasted load and provide the reliability support required in SPP's governing documents. Capacity margin plays an important role in maintaining reliability across the grid and provides system capability to deal with unexpected interruptions to generation equipment occur, increases in demand due to extreme weather, etc. SPP calculates capacity margin by subtracting the total load from the total generation capacity, including the net of firm import and export obligations, divided by the total capacity.

SPP Criteria require a minimum capacity margin of 12%. However, current requirements may not prove adequate in the scenarios outlined above. Many small units could be retired while existing,

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larger units are being retrofitted with equipment that has an unknown impact on the performance and availability of retrofitted generators.

The data utilized by staff in its evaluation of the four scenarios is presented in Tables 1 and 2.

In the *Best Case* scenario roughly 1 GW of capacity was identified by SPP stakeholders as planned for retirement, with 1 GW to be placed into outage for compliance upgrades. This amount is below the volume noted in the reports cited in the Approach section.

The *Low Estimate Case* scenario widens the scope of retirements beyond those surveyed to all SPP generation. In this case, again, there is a limited impact with 3 GW of capacity taken from service.

The *High Estimate Case* scenario utilizes a broader application of the extrapolated information. In this scenario, SPP is forecasted to fall below the minimum required capacity margin. The *High Estimate Case* also demonstrates what may happen due to the tight timeframe around the unit upgrades. If units currently undergoing detailed individual assessments by the utilities with regard to their assessment and determination of the action(s) are retired SPP is further negatively impacted by the regulations and may be unable to maintain system security. A *Business As Usual (BAU) Case* is provided for reference.

**Table 1: 2015 Reliability Outlook**

	BAU	Best Case	Low Estimate	High Estimate	Worst Case
<b>Outages</b>	-	1	2	3	7
<b>Retirements (GW)</b>	-	1	1	3	3
<b>Total Capacity (GW)</b>	69	66	65	63	59
<b>Capacity Margin (%)</b>	19%	15%	15%	11%	5%
<b>Capacity Margin (GW)</b>	13	10	10	7	3
<b>Shortfall (GW)</b>	-	-	-	1	5

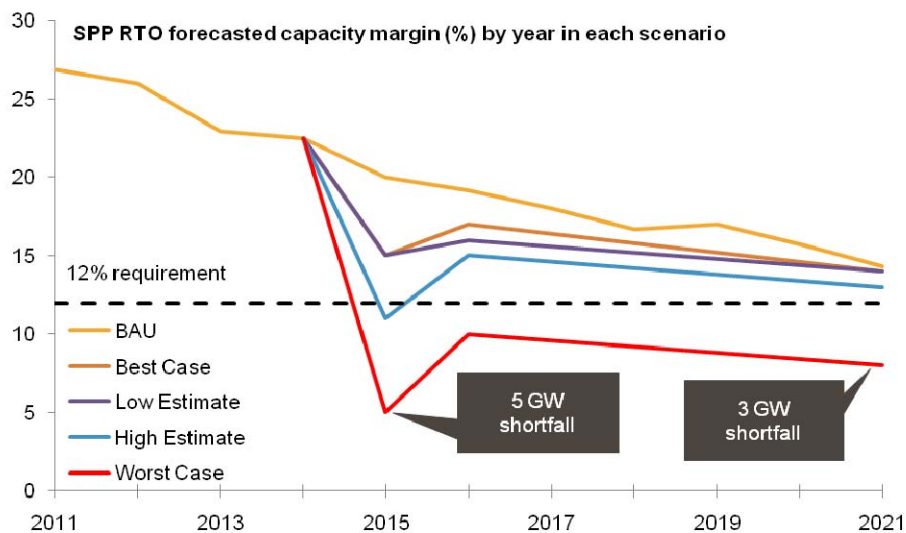
**Table 2: 2021 Reliability Outlook**

	BAU	Best Case	Low Estimate	High Estimate	Worst Case
<b>Outages</b>	-	-	-	-	-
<b>Retirements (GW)</b>	-	1	2	3	7
<b>Total Capacity (GW)</b>	72	70	70	69	65
<b>Capacity Margin (%)</b>	17%	15%	14%	13%	8%
<b>Capacity Margin (GW)</b>	12	11	10	9	5
<b>Shortfall(GW)</b>	-	-	-	-	3

These evaluations were conducted for the years 2015 and 2021 and included multi-year outages necessary for the installation of control equipment, facility retirements, anticipated generation expansions and peak load levels. The expected capacity contribution of wind generation toward summer peak load obligations is relatively minor and has been included, but only at a fraction of nameplate capacity based on SPP Criteria. In addition, demand response has been included in these reliability assessments to the extent it has been reported as a resource in EIA projections.

Chart 2 presents forecasted capacity margins within SPP for the BAU and four scenarios over the next several years. The chart also illustrates the impacts within SPP if the regulations force 7 GW currently under economic evaluation and compliance review into retirement.

**Chart 2: Forecasted Capacity Margins**



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These results are indicative of the range of possible outcomes, but may not reflect pessimistic conditions given the uncertainty which surrounds long-term projections, including future environmental regulations. In the *Worst Case* scenario, SPP expects system reliability within at least five load pockets to be adversely impacted absent aggressive transmission expansion projects, demand response or generation expansion projects.

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## Cost of Environmental Controls

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In its assessment, staff broadly evaluated a range of costs incurred by generation owners due to potential environmental control installations. These expenses would be incurred if generation owners determine that units currently under study will be retrofitted less the expected retirements. Staff evaluated the cost to retrofit the 7 GW planned to be retired in only the *Worst Case* scenario. Table 3 outlines the associated equipment and costs.

Staff identified that approximately \$8.5 billion would be required as initial investments for installation of Bag Houses (BH), Flue Gas Desulfurization equipment (FGD), and Selective Catalytic Reactors (SCR). This case assumes that all units in the worst case are retrofitted. While the estimated costs of installing new environmental equipment to ensure compliance with anticipated regulations are significant, they represent only a portion of the total cost impacts which will be realized on consumer bills. The cost impacts associated with environmental upgrades at existing plants to comply with the proposed rules are comparable to the projected transmission expansion investment which has been approved within the SPP footprint for 2011-2017. However, unlike cost recovery for transmission expansion, which has its costs allocated across the SPP footprint to a large extent, the costs for EPA compliance investments will be much more localized and varied across SPP zones.

**Table 3: 2015 Retrofit Costs**

	\$/kW	Units Impacted	Capacity Impacted (GW)	Total Cost (\$B)
<b>BH</b>	<b>197</b>	<b>34</b>	<b>8</b>	<b>1.5</b>
<b>New FGD</b>	<b>573</b>	<b>39</b>	<b>10</b>	<b>5.5</b>
<b>FGD Upgrade</b>	<b>450</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>SCR<sup>7</sup></b>	<b>250</b>	<b>30</b>	<b>6</b>	<b>1.5</b>
<b>Total</b>	<b>-</b>	<b>42</b>	<b>12</b>	<b>8.5</b>

These evaluations were conducted for 2015 and are based upon cost estimates provided in the ERCOT Report, supplemented by the Edison Electric Institute for SCRs, with equipment installations provided by the surveyed generation owners.

As shown in Table 3, the projected cost to retrofit, in lieu of retirement, in the *High Estimate Case* would be approximately \$8.5 billion. The rate impact and justification cases involved in acquiring such funding from state utility commissions may impact the capability of the utilities to secure funding. Also, the impact on consumer bills should not be understated.

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## SPP's Recommendation to the EPA

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While this initial assessment focuses on coal and gas units and select EPA rules, other pending requirements – carbon dioxide regulations for example – may significantly impact future resource plans, system reliability, and economics. Therefore, it is important to note that this initial assessment does not address the impacts of RICE regulations on the potential loss of small units, upon which many municipalities have relied. Elimination of those units could create local congestion challenges and require both transmission expansion and local programs to keep the lights on.

SPP is concerned that the industry may not be able to meet the abbreviated timeline for compliance with the proposed rules, should they be approved. In this case, unit outages and retirements may adversely impact grid reliability. Therefore, SPP would recommend that the EPA and generation owners collaborate to develop and meet timelines while monitoring equipment installation. Collaboration on the development of compliance plans may lessen the negative impact and/or

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<sup>7</sup> The SCR cost is based on assumptions from the Edison Electric Institute report, estimating costs to be between \$200/kW and \$400/kW, and further discussion with SPP generation owners.

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prevent the unavailability of labor, parts, and other resources that may otherwise result from arbitrary deadlines. Such an approach would also ease concerns over grid security caused by mass outages on generators to install the required equipment.

SPP recommends that the EPA provide a gradual compliance schedule that allows the industry time to meet the requirements in an economical, safe and reliable manner. Working with the industry to institute these changes will allow for a more gradual integration of the compliance costs that could significantly mitigate sudden increases in consumer electricity prices.