

Sunflower Electric Power Corporation

Testimony On
Cross-State Air Pollution Transport (CSAPR) – Final Rule

Submitted to:
U. S. House of Representatives
Committee on Science, Space, and Technology
Honorable Ralph M. Hall - Chairman

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Introduction

Sunflower Electric Power Corporation (Sunflower) appreciates the opportunity to provide testimony to this committee on EPA's Cross-State Air Pollution Rule (CSAPR). For Kansas, CSAPR imposes very near-term requirements (in 2012 and 2014) to reduce annual emissions of nitrogen oxides (NO_x) and sulfur dioxide (SO₂). EPA also proposes to require Kansas utilities to reduce ozone-season emissions of NO_x, also in the very near-term. Under this proposal, Kansas will be required to offset its ozone-season NO_x emissions with additional allowances for the 2012 ozone-season, even though the ozone-season requirements are still only proposed.

CSAPR will significantly undermine the reliability of the electricity transmission and distribution system and increase the cost of providing electric energy in central and western Kansas. Preliminary modeling by the Southwest Power Pool indicates the rule may cause significant voltage reductions in central and southwest Kansas and in the north Texas panhandle, situations which could lead to electricity blackouts.¹

Moreover, EPA's process for promulgating this rule was technically flawed. Because of changes to EPA's modeling in the middle of the rulemaking process, Kansas became subject to significant, potentially unachievable near-term emission reduction requirements with almost no advance notice. Yet the changes result from modeling that is a proprietary "black box", and we are therefore unable to understand the exact basis for the emission reduction requirements to which we have become subject.

¹ See Exhibit 1, slide 7.

The modeling itself is also flawed because it assumes the downwind area that is supposedly affected by Kansas' ozone-season emissions is in nonattainment. Yet actual real-world monitoring data show this area is in attainment. Moreover, the modeling does not take into account future reductions from Kansas emission sources that are either already completed or otherwise locked-in and which will reduce any impacts to this area even further.

In sum, Kansas has become subject to very harsh requirements with little advance notice based on (a) use of a model to which the public does not have access and (b) for the ozone-season requirements, the erroneous modeling assumption that Kansas emissions are causing a downwind county to violate EPA air quality standards.

Sunflower and Mid-Kansas

These comments are provided on behalf of Sunflower and Mid-Kansas Electric Company, LLC (Mid-Kansas). Sunflower and Mid-Kansas are not-for profit electric generation and transmission cooperative corporations that are owned and operated by the rural electric distribution cooperatives to which they supply electricity. These distribution cooperatives, in turn, are owned by their members who are electric consumers— families, farms and other businesses. These electric consumers select their distribution cooperative board members through democratic elections, and these board members in turn appoint the board members of Sunflower and Mid-Kansas.

Sunflower is owned by members Lane-Scott Electric Cooperative, Inc., Dighton; Prairie Land Electric Cooperative, Inc., Norton; Pioneer Electric Cooperative,

Inc., Ulysses; The Victory Electric Cooperative Association, Inc., Dodge City; Western Cooperative Electric Association, Inc., WaKeeney; and Wheatland Electric Cooperative, Inc., Scott City; all in Kansas.

Mid-Kansas Electric Company, LLC, is a coalition of five rural electric cooperatives and one wholly-owned subsidiary including Lane-Scott Electric Cooperative, Inc., Dighton; Prairie Land Electric Cooperative, Inc., Norton; Southern Pioneer Electric Company, Ulysses (a wholly-owned subsidiary of Pioneer Electric Cooperative, Inc.); The Victory Electric Cooperative Association, Inc., Dodge City; Western Cooperative Electric Association, Inc., WaKeeney; and Wheatland Electric Cooperative, Inc., Scott City; all in Kansas.

Together the electricity provided by Sunflower and Mid-Kansas to these distribution cooperatives, and to more than 25 municipalities within the service area meets the electricity requirements of more than 400,000 people in central and western Kansas. Because Sunflower and Mid-Kansas and their distribution cooperative members operate on a not-for-profit basis, the cost of compliance with CSAPR flows directly through to these electricity consumers.

As in many rural areas, these individuals tend to be older and living on fixed incomes and tend to have incomes below the federally-defined poverty level. The people served at retail by the distribution cooperatives include more than 64,000 (16%) above the age of 65 and more than 48,000 (12%) whose annual household income is below the federal poverty level.

CSAPR impact is immediate

The Administrator of the Environmental Protection Agency (EPA) signed the final CSAPR on July 6, 2011.² The rule was published in the *Federal Register* on August 8, 2011 and is effective January 1, 2012. As proposed, the rule was known as the “Clean Air Transport Rule” (CATR) (July 2010). The rule replaces the Clean Air Interstate Rule (CAIR) that was issued in 2005. CAIR was overturned in court, but remains in place until CSAPR goes into effect on January 1, 2012. The CAIR rule did not apply to Kansas, and the CSAPR rule does not provide adequate time for Kansas utilities to properly respond to its requirements.

Because CAIR requirements have effectively remained in place, the utilities covered by that rule continued pollution control projects planned in 2005 and beyond. These projects included the installation of selective catalytic reactors for reducing NO_x emissions and scrubbers for reducing SO₂ emissions. An allowance trading program was established under CAIR for the affected states to assure that utility plants did not exceed the emissions budgets established by EPA. Many of these pollution control projects were completed in 2010 – the last of them will conclude this fall.

However, several states, including Kansas, were not included in the CAIR rule, and therefore Kansas, and these other states, did not plan for nor did they install the long-term, large-scale pollution control projects that were planned and installed in the CAIR states. Kansas was included in CSAPR as proposed, but the NO_x budgets proposed would not have required any emission reductions at any Sunflower or Mid-Kansas coal or gas-based facilities. In fact, because

² 76 Fed. Reg. 48208 (August 8, 2011).

Sunflower was not impacted by the proposed budget for allowances, Sunflower did not even file comments on the proposed rule.

Sunflower, however, was affected by CSAPR as finalized. Under the rule, Sunflower will receive NO_x allowances adequate to generate only about 50% of its energy requirements in 2012 (Phase I), just five months after the rule became final.³ Project engineering, permitting, vendor selection, manufacture and delivery, and installation of projects to reduce emissions generally consume between 18 and 48 months. Recall that the industrial Midwestern and Southeastern states have been working on similar projects since 2005. The imposition of such a compliance schedule on utilities within states that had absolutely no meaningful notice of such requirements is unjustifiable.

Black Box

The heart of CSAPR is the emission budget that is established for each state. State-wide utility emissions are limited to the amount of their budgets, with the possibility that such budgets can be exceeded if, in limited situations, certain other states are able to emit less than their budgets. As noted, for Sunflower, the budgets mean that Sunflower must find a way to reduce or offset 50 percent of its otherwise forecast NO_x emissions by the beginning of next year.

³ The 2010 average NO_x emission rate for Sunflower/Mid-Kansas resources was about 0.30 lb/mmBtu. The 2012 (Phase I) allowances allocated to Sunflower support an average NO_x emission rate of about 0.16 lb/mmBtu. The 2014 (Phase II) average supported by allowances is just over 0.13 lb/mmBtu.

The way EPA performs its modeling, however, prevents Sunflower from fully understanding why it is that, under the proposed rule, Sunflower would have been allocated sufficient NO_x allowances, but under the final rule those allowances have been cut in half. This is because the model EPA uses, the IPM model, is proprietary and the public therefore is unable to replicate the model results. Thus, although Sunflower can understand the different assumptions that EPA used in the modeling that resulted in the final rule as compared with the proposed rule, we cannot track those changes through the model to see exactly why those changed assumptions resulted in the final NO_x budgets.

It is as if we have been given a very large invoice for payment, but are told we cannot perform an audit to determine how the amount due on the invoice was calculated. Indeed, we are not able to know whether the changes in the Kansas budget resulted from a model glitch or unsubstantiated assumptions by EPA.

We think this is an extremely unfair and certainly not a transparent way for EPA to promulgate rules. Given the large costs for Sunflower, Mid-Kansas and Kansas as a whole, and indeed for the whole country, EPA should either make the model available or use a different, non-proprietary model. The stakes are too high for EPA to keep a key part of the rulemaking process secret.

Questionable Modeling of Impact of Kansas Emissions Outside of Kansas

The premise of CSAPR is that utility emissions are being transported to downwind states, interfering with the ability of these downwind states to attain EPA's national ambient air quality standards (NAAQS). EPA proposes that Kansas should be subject to ozone-season NO_x requirements because EPA air

quality modeling shows that Kansas emissions will cause or contribute to a Holland, Michigan (Allegan County) violation of the 8-hour ozone NAAQS. But this modeling is flawed for two reasons.

First, the assumptions EPA uses to estimate Kansas emissions throughout the rulemaking were based upon actual emissions that occurred in 2006, then in 2008, and finally in 2009 and thus they do not take into consideration the substantial emission reductions that have already been or will be achieved by 2012 and 2014 because of emission control projects already completed or in the pipeline. Additionally, the early allowance allocations, even in January 2011, did not penalize the Sunflower/Mid-Kansas generation facilities at all; clearly something has changed, and we cannot see into the "black box" to identify the changes. It seems plausible that if these recent emission reductions from Kansas sources were considered and if the model properly responded to the changes, that at a minimum the modeled impact on the Allegan County, Michigan receptor would almost certainly be less than the 1% threshold adopted by EPA for significance. It seems plausible to us that, as with CAIR, Kansas should be out of CSAPR altogether and the regulatory program would have no effect on Kansas utilities.

Second, based on actual air quality modeling data, Allegan County is no longer failing to attain the ozone standard. In fact, the Michigan DNRE petitioned EPA on August 2, 2011 to move Allegan County to an attainment classification. The required demonstration concludes that current and future expected ozone air quality, based upon local actions, will meet both the 1-hour and 8-hour ozone NAAQS. Thus, EPA's model, which concludes that Allegan County is in non-attainment, does not reflect real-world conditions.

In summary, for ozone-season NOx emissions, Kansas is proposed to become subject to expensive new standards that may place the Kansas electric supply system at significant risk, with very little notice, in order to solve an air quality problem to which Kansas is no longer significantly contributing and that, in any event, no longer exists at the determined receptor in Michigan.

CSAPR Will Have Significant Reliability Impacts in Kansas and Elsewhere

Sunflower is a member of the Southwest Planning Pool (SPP). The SPP is a Regional Transmission Organization (RTO), mandated by the Federal Energy Regulatory Commission (FERC) to ensure reliable supplies of power, adequate transmission infrastructure, and competitive wholesale prices of electricity in an eight-state region in the middle of the United States. As a North American Electric Reliability Corporation Regional Entity, SPP oversees enforcement and development of reliability standards.

SPP engages in regular planning to ensure reliable operation of the system. The SPP transmission planning process is described in Attachment O of the SPP Open Access Transmission Tariff and utilizes three planning horizons. The Near Term Assessment is conducted annually and generally looks at time horizon of three to five years. SPP long range transmission planning is conducted over a three-year planning cycle with a 20-year assessment being conducted during the first half of the three year cycle and a 10-year assessment conducted in the second half of the three year cycle. This open and transparent planning process developed by the SPP stakeholders and approved by FERC is utilized to assure that the type of *incremental* changes in supply and transmission resources that

utilities normally make are planned and implemented consistent with reliability requirements.

However, the requirements of CSAPR, which go into effect in 2012, are being implemented much too quickly to be adequately studied by SPP and accommodated in the SPP's normal planning process. Indeed, the SPP has only recently begun studying the impacts of CSAPR on the reliable operation of the SPP system, because the rule was only recently issued.

Moreover, EPA is not proposing the type of incremental changes for 2012/2014 that would normally be a subject of short-term study by the SPP, a process with sufficient time to plan how to accommodate those incremental changes. Rather EPA is implementing a dramatic shift in operating resources that will lead to a re-dispatch of the system as compared to the current dispatch plan. In fact, the Sunflower/Mid-Kansas resources identified by EPA to be dispatched in those years include substantial operation of the Great Bend, Holcomb 1, and S3 units.

But this unit dispatch makes little sense and it is the *least* likely generation scenario that would be actually dispatched absent CSAPR. EPA allowances are only adequate to support a 50% capacity factor on Holcomb 1, while historical capacity factors are consistently above 90%. Further, natural gas prices make the Great Bend unit the last resource likely to be dispatched to meet the load. Finally, S3 is a black-start combustion turbine with the highest heat rate of any generating unit in the system; it is also the oldest unit operated for the combined Sunflower/Mid-Kansas system and would likely require substantial pre-operational maintenance if such a duty-cycle were to be reasonably expected of it. CSAPR, thus, will have a radical and unplanned effect on our system, the systems of other Kansas utilities, and indeed on the entire SPP.

Had there been time to implement these significant dispatch changes into the way the electric system operates, both in Kansas and throughout the SPP region, the SPP would have long-ago been working on a dispatch model that conforms the proposed dispatch to assess the needed improvements to preserve the real-to world system reliability. Instead SPP is hurriedly assessing the reliability impacts of the CSAPR utilizing EPA's generation dispatch model. Preliminary results suggest that in the summer of 2012 there will be significant degradation of voltage levels in southwest and south central Kansas and the north Texas panhandle, and that these conditions could cause various blackout conditions to occur. At the current time, given CSAPR, the SPP computers have not been able to solve the approximately 50,000 simultaneous equations necessary to indicate that the electricity grid model remains intact. SPP engineers, though, have been able to identify several local severe voltage contingencies in Sunflower's service area.

The SPP continues to study the reliability effects of CSAPR and will have more definitive information in the near future. As previously stated, the short lead-time for implementation of CSAPR does not adequately allow for planning or implementation of environmental controls or additional generating resources needed to comply with CSAPR. This puts electric generation operators, transmission owners, and reliability coordinators in a proverbial "Catch-22" situation: they can either maintain system reliability and violate EPA mandates and be subject to EPA sanctions or they can comply with EPA mandates and risk system reliability and face NERC and FERC sanctions. Most importantly, electric customers will bear the increased costs associated with either outcome.

CSAPR Compliance Options

The reason the CSAPR requirements are so costly and, indeed, may not be achievable is the fact that EPA has overstated the ability of utilities like Sunflower and Mid-Kansas to comply with the rule on such short notice. EPA has suggested that utilities can comply with the rule by installing new control technology, by relying more on natural gas, by allowance trading, by fuel switching to natural gas and low-sulfur coal, and by purchasing electricity from others. Yet none of these options is truly available given the extremely short compliance schedule.

The time-frame for construction of emission control technologies is not adequate – Obviously, for systems that do not have pollution control projects nearing completion as a result of CAIR, there is no possibility of constructing new pollution control devices by the end of this year or even by 2014. In addition to construction times, nearly all of these projects will require the issuance of a PSD construction permit prior to commencing construction; failure to secure such a permit is a criminal offense under the PSD permit program. Sunflower has been engaged in such a process since early 2010, intending to finish the installation of a low-NO_x burner, overfire air system in the fall of 2013. Because of pre-existing plans, we already had a PSD permit application submitted in March 2011, expected a permit issuance by spring of 2012 (about one year), and expected to issue contracts for manufacture in early summer 2012. In order to expedite the process, we issued a letter of intent so as to commence manufacture of the burner components on August 1, 2011 (a year ahead of schedule) and have rescheduled our outage for January, 2012, effectively advancing the project schedule by over 18 months. But this schedule was not without consequences; we expect to pay a 20 to 25% premium for the components, which will now be

manufactured in China. But even if expedited, more capital-intensive projects, such as selective catalytic reactor or scrubber installations, cannot be completed in time to meet Phase II requirements.

New natural-gas based resources cannot be brought on line quickly enough - achieving reductions by bringing new resources on line in such a short time-frame, unless such resources were already in process, simply cannot be done by 2012 or 2014.

Allowance trades within Kansas are inadequate for utilities – CSAPR authorizes intrastate trading of CSAPR allowances, but that will have only a limited effect for Kansas utilities. All Kansas utilities must reduce emissions significantly. It is highly unlikely that any of them can reduce so quickly and so significantly as to generate sufficient allowances to cover the emissions of other Kansas utilities. In Sunflower's situation there will not be an excess supply of allowances to trade among Kansas utilities.

The importation of up to 18% of budgeted allowances from states that have met their objectives is inadequate for Kansas – CSAPR authorizes limited interstate trading of allowances. A state can exceed its budget by up to 18% if another state with which it is authorized to trade has excess allowances. But there is good reason to believe that the trading market will not be robust, particularly by 2012 and even 2014. First, the rule is so new and its effect so little understood because of its complexity that utilities that do generate excess allowances will bank them for their own future use rather than trading them. Second, utilities will likely be particularly cautious about trading given the experience in CAIR. When CAIR was overturned in court, the value of CAIR allowances was immediately reduced to near-zero. Under CSAPR, EPA is about to terminate utility accounts of both CAIR and acid rain allowances. This results in the elimination of millions

of dollars in allowance values. Having seen their significant investments in CAIR allowances disappear, utilities are likely to be reluctant to jump into significant allowance-trading under CSAPR. Finally, utility caution about trading will be enhanced by the significant penalty provisions that are associated with a state exceeding its emissions budget but being unable to cover that excess with allowances from other states.⁴

In sum, it is unreasonable for EPA to expect utilities to rely on trading in the early years of the rule to make up for their inability to install controls fast enough.

Fuel switching – EPA identifies that a key compliance strategy for implementing CSAPR is for utilities to switch from high-sulfur to low-sulfur coal, or from coal to natural gas. Even assuming that sufficient fuel and transportation resources exist for such a strategy to be widely effective, it does not solve the problem for Kansas utilities. Specifically for managing SO₂ reductions there are only two Kansas units that blend some relatively small amounts of local Kansas coal with low-sulfur coal; all other coal-based units already use low-sulfur PRB coal. Further, the act of switching steam units from coal to natural gas fuel to manage NO_x results in only a trivial reduction; switching the generation dispatch from PRB coal-based steam units to gas-based steam units likewise does not accomplish any significant reduction.

⁴ EPA, in the final CSAPR rule, determined that SO₂ allowances would be available for purchase at about \$600, annual NO_x allowances at \$500, and ozone season NO_x allowances at \$1300. First contracts for allowance trading completed just this last week have been reported at SO₂ prices of \$2600 per allowance and annual NO_x allowances at \$3500 each. These prices reported are four to seven times higher than EPA estimated for such transactions.

Electricity purchases from other providers – EPA’s suggestion that the purchase of electricity from other providers is a viable way of meeting the allowance dilemma is not realistic. Electricity markets now take the form of very short-term purchases – known as the existing “next-day market” and the soon to be implemented “day-two” market – and firm power transactions that are for fixed terms of length suitable for the participants. Power purchases as a compliance strategy either will not work or will drive up the cost of electricity.

First, short-term markets rely on price signals determined by individual utilities on an ongoing basis. Like other utilities in the SPP Sunflower prices all of its resources each day into the “next-day” market. For Sunflower to sell electricity to others so that they can meet their CSAPR obligations Sunflower would have to increase generation from its own resources, thereby increasing emissions above the EPA-determined budget which could only be satisfied by purchasing additional allowances. How then does Sunflower price the resources that it would utilize for the benefit of another’s allowance shortages without transferring the same allowance shortage to itself by the same transaction? The net effect of these uncertainties will likely make trading more difficult, not less, and increase the price of electricity to all who make such transactions.

Long-term transactions, on the other hand, are the responsible way to meet pool obligations when such a large part of the native load (50% in the case of Sunflower) now needs to be met with a purchased power contract. However before any utility can expect delivery of electricity by a firm contract it must arrange a firm transmission path, a process that requires the power pool’s involvement to determine whether such a path is available for the transfer of firm electricity from one company to a neighboring company. It is already too late for

Sunflower to acquire such a path in order to meet peak-season 2012 loads, and it is probably too late for the 2013 peak season.⁵

Clearly EPA's conclusion that the purchase of power from other utilities is not a clear path on which utilities can depend for complying with EPA's emission dispatch of electricity producing resources.

Conclusion

CSAPR will result in large consequences for rural Kansas electric consumers, including the undermining of the reliability of the electric system, yet the rule is based on flawed modeling. The model is a "black box", preventing utilities from understanding the significant changes in budgets that occurred from the proposed rule to the final rule. Moreover, for the ozone-season NOx program, the modeling assumes that Kansas emissions are contributing to the inability of a single county in Michigan to attain EPA air quality standards, yet that county is already attaining those standards.

Sunflower and Mid-Kansas appreciate the opportunity to submit this testimony and we would be glad to respond to any questions you might have.

⁵ This process can take 12 to 18 months to complete the studies and if additional transmission needs to be constructed this could take anywhere from 3 to 10 years, depending on the scope of facilities necessary.

COALITION OF NEW UNITS

Comments On
National Emission Standards for Hazardous Air Pollutants from Coal and Oil-Fired
Electric Utility Steam Generating Units

Submitted Electronically to:
The Environmental Protection Agency
Air Docket
Attention Docket ID NO. EPA-HQ-OAR-2009-0234

August 4, 2011

COALITION OF NEW UNITS MEMBERS:

City of Holland Michigan Board of Public Works
CMS Energy Corporation
South Texas Electric Cooperative, Inc.
Sunflower Electric Power Corporation
Wolverine Power Supply Cooperative, Inc.

August 4, 2011

VIA ELECTRONIC MAIL TO: a-and-r-docket@epa.gov

US Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460

Attention: Docket ID Nos. EPA-HQ-OAR-2009-0234 and EPA-HQ-OAR-2011-0044

Re: *National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units*, 76 Fed. Reg. 24976 (May 3, 2011).

Ladies and Gentlemen:

We are all developers of new electric generating units using coal or oil-based solid fuels (pet coke)—collectively referenced as solid-fueled units. Our units have received air construction permits and are at risk of becoming subject to EPA's new-unit standards for purposes of EPA's proposed EGU Mercury and Air Toxics Rule. In all, twelve projects totaling over 9,000 MW of new generation including supercritical pulverized-coal, circulating fluidized bed, and integrated gasification combined-cycle units are affected. Five of those project developers (including project participants) join here to respond to EPA proposed NESHAPs rule; Exhibit A identifying said participants is attached. We write to express grave concern that the Maximum Achievable Control Technology (MACT) standards that EPA has proposed will foreclose development of new solid-fueled units. Many of us intend to file separate comments on this and other issues, but we join together to highlight the issues and show that the effect of the rule is not limited to one or a small group of units but applies to all such new solid-fuel units in general.

A report has already been filed in this docket by Ralph L. Roberson, P.E., of RMB Consulting & Research, Inc., that highlights methodological problems with EPA's proposed rule and demonstrates why he believes new solid-fuel generation cannot be built under the proposed rule. Roberson, who has decades of relevant experience and has worked with many of us on our new units, accurately describes the major problems. His report is attached for convenience.

As set forth in Roberson's report, EPA's approach to standard-setting was to establish a MACT standard for each individual pollutant based on the performance of the best-controlled individual plant for that particular pollutant. However, no existing plant actually meets all of the individual new-unit MACT standards, and EPA did not attempt to show that any existing plant does so. Further, while each of these proposed projects will utilize one of the three current solid-fuel technologies, and while some of them contemplate the use of blended fuels (including biomass), we know of none that have been able to obtain the commercial guarantees based upon meeting the proposed standards guarantees necessary to allow their construction to proceed.

Our conclusion has been reinforced repeatedly in our discussion with vendors; no vendor has offered a guarantee that they can meet the emission limitations proposed in the EGU MACT. The largest air pollution control technology company in the world has stated to EPA representatives at a meeting that Sunflower had with them on June 30, 2011 that they could not guarantee these standards as proposed. Further, Bechtel, the largest utility plant constructor in the US, has confirmed that they will not make any guarantee that is not first offered by a vendor and that has not been adequately demonstrated in practice.

This point is also reinforced in comments filed in this docket on July 8, 2011, by the Union for Jobs and the Environment (UJAE). As shown in the tabular information attached to those comments, data that EPA provided UJAE show that no existing unit meets *all* of the proposed new-unit MACT standards. As the UJAE concluded

The proposed MATS rule would preclude the construction of any new coal-based electric generating units due to the severity of its emission limitations for mercury, acid gases, and particulate matter (PM). Data provided by EPA on June 8, 2011, show that no unit in EPA's sample of more than 200 coal-based generating units meets the combined MATS new source emission limits for mercury, acid gases, and PM (see Attachment 1 and table below).

Additionally, the plant that EPA selected as the best-controlled similar source for PM, the AES Hawaii Unit 1, is not a representative unit.

- It burns Indonesian coal.
- Its generating capacity is nominally 180 MW; but the emissions source identified, in reality, is only half that, and it also burns old tires, used motor oil, and carbon from the State's Board of Water Supply filters.
- The performance data for the unit, moreover, do not appear to be representative of what the unit will regularly achieve in practice.
- Therefore, EPA's PM standard is not representative of what is achievable in practice.

Finally, Roberson's report sets forth concerns as to whether the standards are set so low as to be below method detection limits. For example, as shown in Roberson's report, burning bituminous coal with a nominal chloride content equal to 750 ppm will require approximately 99.95 percent removal to comply with the proposed HCl standard. No vendor will guarantee 99.95 percent removal, which would be necessary to secure financing. Moreover, the proposed HCl standard is 66 times more stringent than the proposed standard for existing units even though all of the existing units selected for acid gas testing in EPA's 2010 ICR used either wet or dry scrubbing systems. As Roberson states, "There is no plausible explanation for how a new scrubber can be 66 times more efficient than the average of the best performing 12 percent of existing scrubbers." Similar control efficiencies for Hg would also be required, again with no guarantees available.

In addition to the *similar source* issue, Roberson also believes EPA made a computational error in converting the AES Hawaii Unit 1 total PM results from input units (lb/mmBtu) to output-based units (lb/MWh). EPA mistakenly assumed that both AES units have a capacity of 180 MW; actually, the capacity of the two-unit plant is 180 MW. This error is easily verified in EPA's spreadsheet because it shows Unit 1 has a heat rate of 5.03 mmBtu/MWh, but the correct value is exactly twice that or 10.06 mmBtu/MWh. When the corrected heat rate (or conversion error) is incorporated into the three individual total PM runs, a repeat of EPA's UPL calculation yields a calculated PM value of 0.10 lb/MWh. Even as unrepresentative as AES Unit 1 may be for the purpose of determining MACT, it does not appear to support an emission limit of 0.05 lb/MWh. We respectfully request that EPA revisit the MACT determinations to ensure that these computational errors are corrected prior to advancing the final rule.

We believe that the decision to adopt standards that foreclose new generation technology using coal or other solid-fuel is not a wise one, nor do we think it is permissible under the Clean Air Act. Since our units are new, they are subject to very recent Best Available Control Technology requirements. In fact, a case-by-case Maximum Achievable Control Technology analysis was performed in nine of these permit applications (In the other three situations the sources were evaluated as not major sources of HAPs, and the case-by-case analysis is not applicable in those situations.). Thus, for all applicable air pollutants, our units will be among the very cleanest coal-fueled units in the country. Constructing our units will ultimately allow the retirement of much older, higher-emitting units with a very significant net air quality improvement. Constructing our units will also create needed new jobs and economic development. We estimate that all of the new units that are now permitted collectively create 17,750 construction jobs and \$21.7 billion in economic investment. Yet these benefits will be sacrificed if EPA finalizes the new-unit standards as proposed and they are applied to those units. Moreover, the very substantial amount of baseload generation we propose to develop will need to be replaced by other baseload resources, either nuclear or natural gas.

The adoption of the proposed standards would constitute a major energy policy determination that has implications far beyond just the units we propose to develop. The adoption of the proposed rule will have significant consequences for the reliability and cost of electricity in this country and for the economy in general. Critically, the proposed rule does nothing to acknowledge the possibility that the construction of new coal units may have been foreclosed because they cannot meet the new limits. EPA should acknowledge and discuss this possibility so that the country does not unintentionally adopt a major new energy policy, without the opportunity to consider the possible outcomes of the decision; especially since the majority of US citizens are unaware of this new policy and its potential negative consequences.

Sunflower staff, and our consultant, Roberson, participated in a meeting with EPA staff in Washington on June 30, 2011, during which we discussed at length our inability to secure vendor and erector guarantees for EPA's proposed limitations that are below detection levels and the fatal flaw that the absence of guarantees bring to project

financing decisions. On several occasions your staff asked that the emission levels for which guarantees are achievable for purposes of the rulemaking be identified in comments. Accordingly, in response to your specific request, we urge you to revise the MACT standards by adopting the most stringent case-by-case MACT determination recently made by the various state permitting authorities. These MACT determinations were conducted in strict compliance with a most rigorous procedure set forth in regulation by EPA, subjected to public review and comment, and in many cases have undergone administrative and judicial review. We recommend the following emission standards for new EGU facilities, all of which were established as MACT for Wolverine Clean Energy Venture (The surrogate metric strategy as proposed by EPA is followed here, with the exception that filterable PM₁₀ rather than PM total is the appropriate metric selected in each of the case-by-case MACT analyses):

TABLE 1 – COMPARISON OF ACHIEVABLE VS. EPA PROPOSED MACT LIMITATIONS

	Permit MACT Analysis (Case-by- case)	EPA-proposed MACT for “new units”	EPA-proposed MACT for “existing units”
PM ₁₀ (filterable)	0.010 lb/mmBtu	0.0056 lb/mmBtu	0.030 lb/mmBtu ¹
HCl (bituminous)	0.0011 lb/mmBtu	0.000323 lb/mmBtu	0.0020 lb/mmBtu
Hg (non- Lignite) ²	0.0077 lb/GWh	0.0002 lb/GWh	0.008 lb/GWh

We note that our proposed emission limitations, while less severe than those proposed by EPA for new units, are also more stringent than those proposed by EPA for existing units. We remind EPA that even our recommended limits, with the exception of PM₁₀, have not yet received either vendor or EPC guarantees, nor have they been established by contract(s). Plant Washington’s limits were not established by the case-by-case determination as they were established following the proposal date of the EPA’s EGU MACT. In this situation the permitting authority simply imposed the EPA’s own proposed rule as permit conditions.

Additionally, EPA should establish a subcategory consisting of units that had received air construction permits but had not yet commenced construction as of the date of EPA’s proposed rule. Such a category would be justified because a substantial amount of time, money, and effort have been invested in these units. Imposing new source standards on these units for which EPA’s proposed rule had not been anticipated during

¹ Limitation indicated is for Total PM₁₀. EPA has not proposed a limit for filterable PM₁₀.

² We do not recommend a specific limitation for lignite coal as we do not intend to use lignite as a fuel. However, EPA should retain a sub-category for lignite in the final rule.

their permit consideration would unreasonably and arbitrarily impose additional costs and burdens on these projects and would likely threaten the viability of many of them. The standards for this subcategory would be based on the anticipated performance of these units (as reflected by the permitted case-by-case emission levels), ensuring a reasonable and appropriate level of HAPs control without unreasonably and arbitrarily upsetting the development of these units.

If EPA does not alter the final emission limits consistent with our recommendations, consistent with the timeline in 40 CFR 63.44(b)(1) and (2), EPA should expressly provide in the final rule a period of eight years following commencement of operation for these facilities to demonstrate compliance with the final HCl, Hg, and the non-mercury metal HAP standards. We also recommend that the final rule provide this same period for compliance for the non-major sources in this group as well. This provision would be both necessary and appropriate, given the absence of currently available vendor and/or erector guarantees necessary so that the current projects may be financed.

We appreciate your attention to this letter and are prepared to meet with you as a group to discuss these matters at your convenience. Please contact Wayne Penrod for additional information or with any questions.

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EXHIBIT A – PERMITTED EGUS IMPACTED BY EPA-PROPOSED NEW UNIT MACT

<i>Plant Name</i>	<i>Developer/Utility</i>	<i>Size (MW)</i>	<i>Type</i>	<i>State</i>	<i>Permit Date</i>
Trailblazer	Tenaska	900	SCPC w/ CCS	Texas	12/14/2010
Taylorville	Tenaska	770	IGCC w/ CCS	Illinois	6/5/2007
Longleaf	LS Power	1200	SCPC	Georgia	5/15/2007
Plant Washington	POWER4Georgians	800	SCPC	Georgia	4/8/2010
Holcomb 2	Sunflower Electric Power	895	SCPC	Kansas	12/16/2010
White Stallion Energy Center	White Stallion Energy	1320	CFB	Texas	12/27/2010
Holland Board of Public Works	City of Holland	78	CFB	Michigan	2/11/2011
Wolverine Clean Energy Venture	Wolverine Power Cooperative	600	CFB	Michigan	6/29/2011
Coletto Creek 2	South Texas Electric Cooperative	650	SCPC	Texas	4/28/2010
Limestone 3	NRG Texas LP	750	SCPC	Texas	12/1/2009
Wendover Complex	Consumers Energy	830	SCPC	Michigan	12/29/2009
Summit	Texas Clean Energy Project	375	IGCC	Texas	12/31/2010
		9168			

Note: Owners/developers/participants of the projects in bold are members of the Coalition of New Units.

EXHIBIT B - COALITION OF NEW UNITS MEMBERS

City of Holland Michigan Board of Public Works — Mr. Loren Howard

CMS Energy Corporation — Ms. Nancy A. Popa

South Texas Electric Cooperative, Inc. — Mr. John Packard

Sunflower Electric Power Corporation — Mr. Wayne E. Penrod


Wolverine Power Supply Cooperative, Inc. — Mr. Brian Warner

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MEMORANDUM

FROM: Ralph L. Roberson, P.E. 
DATE: August 1, 2011
SUBJECT: Comments on EPA's 2011 Proposed Utility MACT Rule

INTRODUCTION

On May 3, 2011 EPA proposed its National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units¹ (76 Fed. Reg., 24,976). Because the emission standards set forth in this NESHAPs are based on emission reductions assuming application of maximum achievable control technology (MACT), such rules are often referred to as "MACT rules" or "MACT standards." I, in my capacity as a Senior Consultant with RMB Consulting & Research, Inc. was asked to review and to provide technical comments on EPA's proposed EGU MACT Rule. Specifically, I was asked to focus on the proposed emission limits that affect new, coal-fired units, recognizing that the emission limits for new units are applicable to any EGU that commenced construction after the proposed MACT Rule was published in the Federal Register.

Based on my review of the proposed MACT Rule, and based on my ~40 years of experience in air pollution control, I have significant concern that new coal-fired electric generating units will be unable to meet the standards for new units in EPA's proposed MACT rule.² If my concerns are correct and EPA fails to increase the emission limits in the final rule, the result will be that constructing new coal-fired electrical generation capacity in the United States will no longer be a viable option. The basis for my conclusion is provided in this memorandum.

OVERVIEW

Over the 20 plus years since the U.S. Congress amended Section 112 of the Clean Air Act (CAA), it has generally become accepted that EPA is required to determine MACT floors for new units that reflect the emission control that is achieved in practice by the best controlled similar source. On first glance, this may appear to be a relatively straightforward procedure. However, in reality, determining what "achieved in practice" actually means as well as defining a similar source has proven to be very challenging for the Agency.

I have several levels of concern as to the effect the new unit emission limits presented in Table 1 of the proposed rule will have on new coal-fired units.³ First, EPA employs what has become known as a "Franken-Plant" approach to set emission limits for individual hazardous air

¹ 76 Fed. Reg., 24,976 (May 3, 2011).

² My review and reference to new coal-fired units does not include IGCC units, which are regulated in a different subcategory from coal-fired units in EPA's proposed MACT rule.

³ 76 Fed. Reg., 25,124 (May 3, 2011).

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pollutants (HAPs) under which no single existing unit has been shown to meet all of the proposed standards. Second, given the huge database generated by EPA's massive 2010 EGU information collection request (ICR), simple probability theory informs us that there will be some extremely low concentrations measured – even though those measurements likely cannot be replicated. Third, when EPA identifies the best performing unit as the one with the lowest emissions, the Agency is often working with data points that are at or below the method detection limits.

TECHNICAL DISCUSSION

Franken-Plant Approach

The way in which EPA developed its proposed MACT emission limits has become known as the “Franken-Plant” approach. EPA has determined each individual MACT limit based on emissions of the best performing unit for that particular pollutant or HAP. In reality, however, no actual single plant meets all of the MACT standards that EPA has proposed, just as Dr. Frankenstein's fictitious monster bore no resemblance to an actual human being.

Although EPA's “Franken-Plant” approach for setting emission limits for existing sources is equally flawed to the Agency's approach for setting emission limits for new sources, it is easier to demonstrate and comprehend the Agency's error for new sources. The relevant statutory provision is, *the maximum degree of reduction in emissions that is deemed achievable for new sources in a category or subcategory shall not be less stringent than the emission control that is achieved in practice by the best controlled similar source.*⁴ Note that the statute refers to a single source – not multiple sources. If Congress had intended for EPA to set emission limits based on a “Franken-plant” approach, the statute would read -- *best controlled similar sources.*

Using three EPA spreadsheets that the Agency posted on one of its web sites,⁵ it is fairly straightforward to determine which individual unit EPA used to set the MACT floor for new units. Those units are listed in Table 1. From Table 1, it should be obvious that no existing unit meets all of the proposed emission limits for a new EGU.

Table 1. EPA's Franken Plant Approach For New Units.

Pollutant	Facility	99% UPL (lb/MWh)	Total Metal Ranking
Total PM	AES Hawaii	0.049	11 th
Total Metals	Cedar Bay Unit A	3.3×10^{-5}	--1 st --
Antimony (Sb)	AES Hawaii Unit 2	7.6×10^{-8}	11 th
Arsenic (As)	Oak Grove Unit 1	1.6×10^{-7}	104 th
Beryllium (Be)	Chamber Cogen Unit 2	2.2×10^{-8}	7 th
Cadmium (Cd)	Walter Scott Unit 4	3.7×10^{-7}	3 rd
Chromium (Cr)	PSEG Mercer Unit 1	1.7×10^{-5}	56 th
Cobalt (Co)	Cholla Unit 3	7.2×10^{-7}	62 nd

⁴ 42 U.S.C. §7412(d)(3), emphasis added.

⁵ See, *floor_analysis_coal_pm_031611.xlsx*, *floor_analysis_coal_hcl_031611.xlsx*, and *floor_analysis_coal_hg_051811.xlsx*.

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Lead (Pb)	Oak Grove Unit 1	8.8×10^{-7}	104 th
Manganese (Mn)	Weston Unit 4	3.1×10^{-6}	3 rd
Nickel (Ni)	Weston Unit 4	3.2×10^{-6}	3 rd
Selenium (Se)	PSEG Mercer Unit 1	2.5×10^{-5}	56 th

Hydrogen Chloride (HCl)	Logan Unit 1	2.6×10^{-4}	n/a
Mercury (Hg)	Nucla Unit 1	1.7×10^{-5}	n/a

In the above table, I have included dotted horizontal lines to differentiate among the optional emission limits for non-Hg metallic HAPs. The mercury and hydrogen chloride limits must be complied with individually, independent of the option chosen for non-mercury metallic HAPs.

I believe Table 1 clearly demonstrates the fallacy in the EPA's Franken-Plant approach. Consider the following EPA statements:

For the non-Hg metallic HAP, we chose to use PM as a surrogate. Most, if not all, non-Hg metallic HAP emitted from combustion sources will appear on the flue gas fly-ash. Therefore, the same control techniques that would be used to control the fly-ash PM will control non-Hg metallic HAP.⁶

Oak Grove Unit 1 is EPA's basis for two individual metallic HAP emission limits, arsenic and lead. The key question is how or what control technology could the Oak Grove owners add to meet the other metallic HAP limits given (1) EPA's statement that the same control techniques that work for fly-ash PM also work for non-Hg metallic HAPs and (2) Oak Grove is already the best performing unit for not one but two non-Hg metallic HAPs. EPA's rejoinder to this argument may very well be that compliance with the individual non-Hg metallic HAP limits is an option and not a requirement. This is an inadequate response and misses the point. EPA should not be permitted to base a portion of a suite of emission limits upon the performance of a single unit when that same unit cannot comply with the other enforceable components of that same suite of emission limits. Moreover, the unit that formed the basis for one of the regulated HAPs (e.g., total PM) may not meet one of the other mandatory limits (e.g., HCl). AES Hawaii Unit 1 is the basis of the new unit total PM limit, but the HCl results reported in the ICR data are 66 times the proposed new unit HCl limit. Nucla Unit 1 is the basis of the new unit total Hg limit, but the total PM results reported in the ICR data are almost an order of magnitude higher than the proposed new unit total PM limit.

Best Performing Similar Source

Section 112(d)(3) of the CAA has been interpreted to direct EPA to set emission limits for new sources no *less stringent than the emission control that is achieved in practice by the best controlled similar source*. As noted in Table 1, EPA's PM limit for new coal-fired EGUs units is based on test results from AES Hawaii Unit 1. AES Hawaii is the only coal-fired plant in Hawaii, and the plant has a generating capacity of 180 MW. Unit 1 is only capable of supplying

⁶ 76 Fed. Reg. 25,039, col. 3 (May 3, 2011).

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one-half of the steam required by the 180 MW turbine/generator, so Unit 1 in effect has a capacity of 90 MW. The AES Hawaii unit burns coal, which is imported from Indonesia. To supplement the imported coal, the unit also burns old tires, used motor oil, and carbon from Board of Water Supply filters. While EPA is mandated to set limits for new sources based on the *maximum degree of reduction in emissions that is deemed achievable*, such degree of emission control must be *achieved in practice by the best performing similar source*. It is quite clear there is not or most probably will not be another similar source to AES Hawaii in the continental United States.

Beyond the *similar source* issue, I believe EPA made a computational error in converting the AES Unit 1 total PM results from input units (lb/10⁶ Btu) to output-based units (lb/MWh). EPA mistakenly assumed that both AES units have a capacity of 180 MW; in point of fact, the capacity of the two-unit plant is 180 MW. This error is easily verified in EPA's spreadsheet, because the spreadsheet shows Unit 1 to have a heat rate of 5.03 million Btu per MWh, when the correct value is exactly twice that or 10.06 million Btu per MWh. When I correct the heat rate or conversion error in three individual total PM runs and simply repeat EPA's UPL calculation, I obtain 0.10 lb/MWh. Even as an unrepresentative unit that AES Hawaii may be, it does not support an emission limit of 0.05 lb/MWh.

EPA's approach is also flawed with respect to "achieved in practice." It is possible and perhaps even likely that emission rate at which the AES Hawaii Unit 1 was tested at is not achieved very often. Clearly, EPA analysis has no way of knowing whether the reported AES emission rate can be achieved 10 percent of the time, 50 percent of the time or maybe even 90 percent of the time. Regardless, EPA has used this value to propose an emission limit that must be complied with continuously and even include periods or start-up and shutdown. However, EPA has placed no data or analysis in the rulemaking docket to demonstrate that its proposed emission limits can be achieved in practice.⁷

Issues With EPA's Variability Analysis

EPA's attempt to address emission variability through the use of an upper prediction limit (UPL) is fundamentally flawed. The UPL approach does not accomplish what the Agency purports it to accomplish. Failing to address variability correctly means EPA's proposed rule is technically

⁷ I am aware of some informal discussion that EPA may realize that the AES Hawaii Unit 1 is not a representative unit to rely on for setting the PM standard and that it might now seek to justify its proposed, new unit PM limit based on the performance of NRG's Dunkirk Unit 1. I observe at least three problems with such a potential revision. First, the EPA spreadsheet that is posted on the web and used to calculate the PM floors for coal-fired units is linked directly to AES Hawaii for the new unit PM limit. Second, Dunkirk Unit 1 has a new fabric filter and a dry sorbent injection (DSI) system. However, Dunkirk 1 does not comply with EPA's proposed new unit HCl emission limit. Undoubtedly, Dunkirk will need additional technology (e.g., flue gas desulfurization (FGD) system) to comply with the new unit HCl limit. Since the mist eliminators required by FGD systems are less than 100 percent efficient, I would expect PM emissions to increase on the Dunkirk unit once an FGD system is installed. (This is another fallacy in EPA's "Franken-Plant" approach.) Third, the same EPA spreadsheet that shows AES Hawaii to be the basis of the new unit PM limit (UPL = 0.049 lb/MWh) also shows that Dunkirk's UPL is equivalent to 0.14 lb/MWh. Thus, if EPA wishes to rely on Dunkirk Unit 1 rather than AES Hawaii Unit 1, it will have to significantly increase the new unit PM emission limit.

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deficient and also at odds with several rulings by the D.C. Circuit Court of Appeals.⁸ EPA used the following formula to estimate the UPL for the best performing unit:

$$UPL = \bar{x} + t(0.99, n - 1) \times \sqrt{s^2 \left(\frac{1}{n} + \frac{1}{m} \right)}$$

Where:

n = the number of test runs for best performing source

m = the number of test runs in the compliance average

\bar{x} = mean of the data for top performing unit

t(0.99, n - 1) = 99th percentile of the T-Student distribution with n - 1 degrees of freedom

s² = variance of the data from the top performing source.

The problem with EPA's approach is that the Agency is applying the UPL formula to very incomplete data, especially for the new unit analysis. For each HAP, EPA typically has three sampling runs that were performed very close in time (i.e., at a maximum, over 3 consecutive days) for the single, best performing unit. The variance (s²) that EPA calculates using the formula above is only representative of a very limited set of operating conditions and probably little, if any, fuel variability. Thus, EPA is only predicting the 99th percentile of a very limited range of operation and not necessarily a level that can be complied with at all times and under all operating conditions.

Issues With Detection Limits

EPA's handling of measurements at or below method detection limits (MDLs) exacerbates the variability flaws discussed above. For example, the proposed emission limit for hydrogen chloride (HCl) for new, coal-fired units is 0.30 lb/GWh. This limit is based on measurements from Logan Unit 1, all of which are reported to be less the MDL. EPA's proposed MACT floor for HCl is calculated as three times the highest MDL for the three sampling runs. In other words, the HCl floor is based in one constant (3) multiplied by another constant (MDL). Thus, the proposed HCl limit is not only based on non-detected concentrations, but also fails to account for any process variability.

A simple calculation further demonstrates why the proposed HCl limit for new units is neither feasible nor achievable, expect perhaps for a unit burning coal with low chlorine content. The proposed limit, 0.30 lb/GWh, is equal to 0.000033 lb/10⁶ Btu, assuming a heat rate of 9,000 Btu/KWh. As the following calculation shows, to burn bituminous coal with a nominal chlorine content equal to 750 ppm will require approximately 99.95 percent removal to comply with the proposed new unit limit. This is a significant scrubbing requirement and will almost certainly require wet scrubbing.

⁸ See, for example, *National Lime Association v. EPA*, 627 F.2d 416 (DC Cir 1980) (holding that EPA failed to show how the standard proposed was achievable under the range of operating conditions that might affect the emission that was being regulated).

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$$HCl \text{ inlet} = \frac{750 \text{ ppm}}{12,000 \text{ Btu/lb}} \times \frac{36.5 \text{ lb HCl}}{35.5 \text{ lb Cl}} = 0.064 \text{ lb}/10^6 \text{ Btu}$$

$$Removal = \frac{In - Out}{In} = \frac{0.064 - 0.000033}{0.064} \times 100\% = 99.95\%$$

It is inconceivable that any vendor would ever warrant or guarantee 99.95 percent removal of any pollutant. Another touchstone comparison that EPA staff apparently did not address is comparing the proposed existing unit HCl limit to the proposed new unit limit. The proposed limit for new units is 66 times more stringent than for existing units; yet all of the existing units selected for acid gas testing pursuant to EPA's 2010 ICR used either wet or dry scrubbing systems. There is no plausible explanation for how a new scrubber can be 66 times more efficient than the average of the best performing 12 percent of existing scrubbers.

Lastly, while working on several new coal-fired facilities (e.g., Plant Washington, Longleaf Energy and Holcomb 2) in various phases of the permitting process, I did not observe any willingness of PM control technology vendors to entertain performance guarantees below the range of 0.009 to 0.01 lb/10⁶ Btu. Of course, this was for filterable PM – not total PM. I do not believe it will be possible to obtain a performance guarantee for EPA's proposed total PM limit. If a prospective power developer cannot obtain a performance guarantee, project financing will be jeopardized and no new coal-fired units will be constructed.

Issues With the Form of the PM Emission Limits

EPA proposes to regulate total PM, which is defined as the sum of filterable PM and condensable PM, solely on the basis of the behavior of selenium (Se). I disagree with EPA's decision on several levels. First, there is overwhelming data (both historical and the 2010 EGU ICR) that support using filterable PM as the surrogate for antimony, arsenic, beryllium, cadmium, chromium, cobalt, lead, manganese, and nickel. While there is variability in the Se results, EPA's own data show exceptionally high removal percentages for all of the metals for all coals and all control technology configurations.⁹ EPA states that the results for Se removal were less consistent. However, when we examine EPA's results closely, it appears that EPA is trying to distinguish Se where there is very little real difference. For example, EPA states that the results for Se control were consistently very good when subbituminous coal was fired. EPA also states that when a fabric filter was the primary control device, Se control was consistently good. Thus, the only questionable configuration for Se control appears to be when bituminous coal is fired and an electrostatic precipitator (ESP) is the only control technology. I believe EPA has unnecessarily complicated the control and regulation of non-Hg HAP metals based on shaky technical grounds. My analysis of the ICR data leads us to conclude that a unit cannot comply with the emission limits in the proposed rule while burning bituminous coal and only having ESP control technology. EPA's own analysis projects the installation of fabric filters for 166 GW of capacity.¹⁰

⁹ 76 Fed. Reg. 25,038, col. 3 (May 3, 2011).

¹⁰ *Regulatory Impact Analysis of the Proposed Toxics Rule*, U.S. Environmental Protection Agency, p. 8-14, March 2011.

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Second, total PM consists of two components, filterable PM and condensable PM. Since no single EPA method measures both filterable and condensable PM, a minimum of two different EPA sampling methods must be utilized to determine total PM emissions. For the ICR, EPA specified OTM-28 for condensable PM measurement. Since the section 114 ICR letters were mailed by EPA to EGUs (December 2009), the requirements of OTM-28 have been incorporated into EPA Method 202, which is one of the proposed compliance methods. Method 202 has been flawed since it was issued by the Agency 20 years ago. Despite recent cosmetic changes to Method 202 by the Agency, the method remains flawed and yielded very inconsistent ICR test results. As EPA is aware, the Electric Power Research Institute (EPRI) has conducted numerous analyses on the EGU ICR data, and EPRI will be submitting detailed comments under its own cover. Among the EPRI results I am privy to are a series of regression analyses of the individual metals versus the various PM fractions (i.e., filterable, condensable and total). The PM component with clearly the least explanatory power was condensable PM. Part of the reason for lack of correlation is likely due to the poor quality of condensable PM data collected with EPA Method 202.

CONCLUSION

For the reasons provided in this memorandum, proposing MACT emission limits based on an EGU that is not similar to other EGUs; that no EGU in existence now meets; and that are below detection limits for many of the regulated HAPs is not a technically defensible approach. EPA's approach to setting MACT limits will, in all likelihood, result in reversible error that simply will lead to delay in new EGU construction without any quantifiable environmental benefits whatsoever.

Sunflower Electric Power Corporation

Comments On

National Emission Standards for Hazardous Air Pollutants from Coal and Oil-Fired Electric Utility Steam Generating Units.

Submitted Electronically to:

The Environmental Protection Agency

Air Docket

Attention Docket ID NO. EPA-HQ-OAR-2009-0234

August 4, 2011

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1. INTRODUCTION

On May 3, 2011, the Environmental Protection Agency (EPA) proposed its National Emission Standards for Hazardous Air Pollutants (NESHAPS) from Coal and Oil-Fired Electric Utility Steam Generating Units¹ (76 Fed. Reg., 24,976). Emission standards set forth in this NESHAPs are directed at coal and oil-fired electric utility steam generating units (hereinafter referred to as EGUs) and are based on emission reductions assuming the application of maximum achievable control technology (MACT), and are commonly referenced as "MACT rules" or "MACT standards".

Sunflower Electric Power Corporation (Sunflower) appreciates the opportunity to comment on EPA's proposal for National Emission Standards for Hazardous Air Pollutants for Coal and Oil-Fired Steam Generating Units (HAPs) and on the New Source Performance Standards (NSPS) for Fossil-Fuel-Fired Electric Utility Units.¹ These proposed rules will significantly impact the facility operations and the cost of providing electric energy to the people of central and western Kansas.

Sunflower is one of sixty-five consumer-owned rural electric generating and transmission cooperatives (G&Ts) that generate and transmit power to 670 of the 865 consumer-owned distribution cooperatives in the United States. Sunflower is owned by members Lane-Scott Electric Cooperative, Dighton; Prairie Land Electric Cooperative, Norton; Pioneer Electric Cooperative, Ulysses; The Victory Electric Cooperative Association, Dodge City; Western Cooperative Electric Association, WaKeeney; and Wheatland Electric Cooperative, Scott City, Kansas. Mid-Kansas Electric Company, LLC, is a coalition of five rural electric cooperatives and one wholly-owned subsidiary including Lane-Scott Electric

¹ 76 Fed. Reg. 24976 (May 3, 2011). [Hereinafter referred to as the proposed HAPS and NSPS rules].

Cooperative, Dighton; Prairie Land Electric Cooperative, Norton; Southern Pioneer Electric Company, Ulysses; The Victory Electric Cooperative Association, Dodge City; Western Cooperative Electric Association, WaKeeney; and Wheatland Electric Cooperative, Scott City, Kansas. Together the energy provided to these distribution cooperatives meets the energy requirements of more than 400,000 people in central and western Kansas. These companies are owned and operated on behalf of the distribution cooperatives they serve. In addition these cooperatives provide energy to more than 25 municipalities within the service area.

2. EXISTING SUNFLOWER/MID-KANSAS COAL-BASED EGUS

Sunflower owns and operates one 360-MW coal-based EGU, Holcomb 1 (H1), located in Finney County, Kansas. Mid-Kansas receives the energy output from an 8 percent (168 MW) purchased power agreement (PPA) from the 2160 MW coal-based EGU(s) at Jeffrey Energy Center (JEC) located in Potawatomie County, Kansas. JEC is primarily owned and is operated by Westar, Inc. Additional energy necessary for the Sunflower/Mid-Kansas system is generated by 125 MW of wind resources and more than 600 MW of natural gas resources. The proposed rules will require physical improvements or modifications at all existing coal-fired facilities.

H1 is equipped with a dry flue gas desulfurization (Dry FGD) system which includes a spray-dry absorber, low-NO_x burners, and a reverse-air fabric filter (FF). This equipment was installed during initial construction and has been operated since 1983. Sunflower has substantial experience in evaluating the level of hazardous air pollutant emissions (HAPs) emissions from this unit, having performed substantial test programs and reported the results of such tests to the Kansas Department of Health and Environment (KDHE), Region VII of the

U.S. EPA, and in various public forums since the late 1990s. Holcomb 1 is not a major source of HAP emissions, however under the proposed mercury MACT limit it will be necessary to install new mercury control technology. The installed Dry FGD/FF systems are excellent control technologies that, when deployed together, will satisfy the final particulate matter surrogate for trace metals as well as the sulfur dioxide surrogate for acid gases.

The three 720-MW EGUs at JEC are equipped with spray-type wet flue gas desulfurization (Wet FGD), low-NO_x burners and overfire air, and high-efficiency cold-side electrostatic precipitators (ESP). Powdered Activated Carbon (PAC) is injected for mercury control. Certain Flue Gas Particulate (FGP) control improvements are planned by Westar, some of which will improve the performance of the technology to ensure compliance with the EGU MACT.

3. FUTURE SUNFLOWER/MID-KANSAS COAL-BASED EGU

Sunflower and its development partner, Tri-State Generation and Transmission Association, Inc., are developing Holcomb 2 (H2), an additional 895-MW coal-based generating unit on the existing Holcomb Station site. While final ownership and participation agreements are not yet final, Mid-Kansas expects to substantially replace its 168-MW PPA from JEC expiring in 2019.

Sunflower received a PSD construction permit in December 2011 and is at risk of becoming subject to EPA's new-unit standards for purposes of EPA's proposed EGU MACT Rule. Based upon our extensive H1 testing experience we believe that the Maximum Achievable Control Technology (MACT) standards that EPA has proposed will foreclose development of new solid-fueled units, including the permitted H2 EGU. H2 is not a major source of HAPs.

4. IN GENERAL, NEW COAL-BASED EGUS, INCLUDING H2, CANNOT BE CONSTRUCTED

A report filed in this docket by Ralph L. Roberson, P.E., of RMB Consulting & Research, Inc., highlights the methodological problems with EPA's proposed rule and demonstrates why he believes new coal-based generation cannot be built under the proposed rule. Roberson, who has decades of relevant experience and nearly a full decade of experience on our H1 unit, worked with us extensively to permit our new H2 unit. His report is attached for convenience.

Roberson's report identifies that the standards are set so low as to be below method detection limits. While problems in the MACT abound, one example in Roberson's report relates to EPA's conclusion for establishing an acid gas emission limit; burning bituminous coal with a nominal chloride content equal to 750 ppm will require approximately 99.95 percent removal to comply with the proposed HCl standard. No vendor will guarantee 99.95 percent removal, which would be necessary to secure financing. Moreover, the proposed HCl standard is 66 times more stringent than the proposed standard for existing units, even though all of the existing units selected for acid gas testing in EPA's 2010 ICR used either wet or dry scrubbing systems. As Roberson states, "There is no plausible explanation for how a new scrubber can be 66 times more efficient than the average of the best performing 12 percent of existing scrubbers." Surely such absurd conclusions point to the necessity of establishing subcategories, so as to be able to make logical similar source analyses for the purpose of establishing MACT.

The general point was further reinforced in comments filed in this docket on July 8, 2011, by the Union for Jobs and the Environment (UJAE). UJAE concluded

“The proposed MATS rule would preclude the construction of any new coal-based electric generating units due to the severity of its emission limitations for mercury, acid gases, and particulate matter (PM). Data provided by EPA on June 8, 2011, show that no unit in EPA’s sample of more than 200 coal-based generating units meets the combined MATS new source emission limits for mercury, acid gases, and PM . . .”.

Our conclusion was made irrefutable in our discussion with vendors and erectors; Alstom, the largest air pollution control technology company in the world, told us and EPA representatives at a June 30, 2011, meeting that they could not guarantee these standards as proposed. Further, Bechtel, the largest utility plant constructor in the US, has confirmed that they will not make any guarantee that is not first offered by a vendor and that has not been adequately demonstrated in practice.

The adoption of the proposed rule will have significant consequences for the reliability and cost of electricity in this country and for the economy in general. Critically, the proposed rule does nothing to acknowledge the possibility that the construction of new coal units may have been foreclosed because they cannot meet the new limits. Sunflower believes only Congress, not an administrative agency, can establish such a far-reaching policy. In this situation, EPA, unless it dramatically changes its approach, will have established a MUCT² standard, rather than a MACT standard.

We concur with the comments related to new unit MACT limitations as submitted by the Coalition of New Units.

² Maximum Unachievable Control Technology.

5. EPA MUST SUBCATEGORIZE THE EXISTING UNIT EGU FLEET TO PROPERLY PROMULGATE MACT STANDARDS

EPA's proposed existing unit MACT standards are not achieved by the best performing 12 percent of existing sources, rather EPA has, in most situations, aggregated all sources, including widely disparate fuel-burning technologies, fuel sources, and air pollution control technologies into a single category. This is not practicable in the regulatory process and it ultimately leads to much uncertainty on the part of sources. EPA has selected the source with the lowest emission rates for each particular HAP without regard to the performance of those same sources for other HAPs.

This so-called "Franken" MACT approach is not legal or appropriate. Under it,³ the top performing group of units for each HAP is different. While it is possible that a few select units out of the existing 1091 sources in the category can meet all the proposed MACT standards, there is not a single group that that comprises the average of the top performing 12 percent for each MACT.

Further EPA suggests that one merely need to connect the control technology dots for each individual HAP to ensure compliance in any case. While this may, at least to the uninformed, seem plausible, it surely cannot be to such experienced regulators as reside at EPA. An everyday analogy may serve to illustrate how impractical the conclusion arising from this process may be.

Were this process extended to a motor vehicle purchase decision, an uninformed buyer would quickly learn that he could not select a vehicle that would simultaneously yield maximum fuel economy, carry the payload of a one-ton

³ 75 Fed. Reg. at 25,045

truck, and move a five-member family across the US on vacation, comfortably. Yet these requirements, when placed upon the thankfully diverse coal-based generating fleet, are defended by EPA as not only plausible, but somehow are required under the law. The endpoint of the EGU MACT following this tortured path is no more logical than that of the example given.

It is appropriate, and EPA must therefore consider repropose the entire MACT, without incorporating the “Franken” MACT approach, and after having properly categorized sources based upon broad fuel sources, generation technology, and control technology performance differences⁴.

6. GENERAL COMPLIANCE SCHEDULE REQUIREMENTS IN NESHAPS ARE INADEQUATE; SUCH DIFFICULT AND COMPLEX COMPLIANCE REQUIREMENTS ARE NOT ROUTINE IN OTHER SOURCE CATEGORIES AND WERE NOT CONTEMPLATED IN THE CAA

It is almost certain that the emission reduction technologies necessary to comply with the EGU MACT cannot be accomplished in the three-year timeline provided in the statute. Scrubber installations may be expected to occupy three to five years for each project. Permitting authorities, architect/engineering firms, vendors, and construction labor supply are likely inadequate to meet this schedule. In fact, it is likely that some coal-based facilities will either be retired or fuel-switched, even temporarily, because they will not be able to comply within the time requirements. Individual state governors can extend the compliance period by one year, and the President can further extend the compliance period another two years.

⁴ At a minimum two additional fuel categories, bituminous and sub-bituminous; two distinct furnace type, CFB and PC; and two distinct control technology suites represented by Wet FGD and Dry FGD must be considered. Additionally small units operating at low capacity factors should be evaluated for the relative health impacts, and EGUs that are not major sources should be distinguished in such sub-categorization of sources.

EPA must go on record advising the states and the President to immediately undertake such action to avoid disruption in energy supply and unnecessary increases in energy cost during the next several years. EPA has not taken this position. Rather it lessens the potential that the extensions provided within the statute will be utilized by generalizing that the improvements can somehow be accomplished within three years, even in the face of almost universal disagreement among the stakeholders and other government agencies. EPA's position in this regard is harmful; EPA should recommend that a period of six years for major sources of HAPs, and eight years for non-major sources of HAPs is expected to conclude the necessary improvements.

7. MACT FLOOR LIMITS CANNOT BE MET DURING EVERYDAY UNIT OPERATION BECAUSE THE VARIABILITY METHOD UTILIZED IN ESTABLISHING THE LIMIT IS FLAWED

EPA makes several errors in the assumptions on unit emissions variability that are critical and lead to MACT limits certainly not attainable even by the top performing units each and every day under all operating conditions.⁵

- The mean of three separate runs are inadequate to determine the MACT upper prediction limit (UPL). While such methodology is appropriate for compliance testing with a high confidence, EPA would never allow a permit condition to be established after using such limited data because of concerns it might be established too high. Day-to-day operating variability cannot be determined using three tests in one day, or even on three successive days.
- Similarly fuel variability cannot be properly established in such a test profile, especially if unit train fuel deliveries from a variety of mines are to be expected.

⁵ Id. at 25,041

- The assumption that all events that might occur on a given unit can be established is invalid. A simple review of stack CEMS data for SO₂ or NO_x control variability is imperative. We suggest a five-year review of the top 12 performing units over the last five-year period for both these gaseous pollutants will clearly indicate the occasional absence of normal distribution in the data. So much the more must be expected for occasional measurement or for PM CEMS for which sufficient data is not yet available.

A more plausible UPL could be established by calculating the mean and standard deviation on the basis of ALL stack test data for all units in each sub-category equipped with similar control technology. EPA has the data, it must simply buckle-down and make proper use of it. Sunflower has performed several such analyses in establishing BACT limits for the H2 unit, and would discuss such methods with EPA at their request. EPA must establish MACT limits using data from the top performing units in a similar fashion to account for all reasonable variability so that sources could be expected to perform every day and in all operating conditions.

8. A PM FILTERABLE MACT LIMIT SHOULD BE USED INSTEAD OF A PM TOTAL METRIC

The proposed PM total MACT is unworkable for several reasons. Methods 5 and 202 would be utilized to determine the condensable and filterable portions of PM total, with PM CEMS measurements used to set unit operating limits afterwards is not workable.⁶ Short, infrequent periods of Method 5 testing cannot account for variations in actual PM filterable levels over a range of unit operating conditions that a PM CEMS would surely record. There is no reason to expect Method 202 results, when there is no continuous measurement system, to do anything but

⁶ Id. at 25,029

confound any attempted correlation as a compliance determinate. EPA has offered no rational explanation for offering this complicated and uncertain PM MACT compliance methodology; rather the proposal seems more whimsical than considered. The PM MACT must be based on a PM filterable limit only.

9. CONCLUSION

Sunflower supports the comments and conclusions developed by our national association, the National Rural Electric Cooperative Association (NRECA). In particular we share their disappointment in the process EPA employed as an attempt to meet its obligations under the Small Business Regulatory Enforcement Fairness Act (SBREFA).⁷ At the onset, the agency's own SBERFA process for ensuring consideration of alternative regulatory methods on small entities connected with this rulemaking was severely truncated. Indeed, at the hastily convened meeting called to ostensibly comply with the process, no regulatory options were provided and no follow-up meeting was scheduled.

Finally, in further support of the options available to EPA for alternative strategies for small businesses and small sources, it is significant that Congress itself clearly distinguished between major sources of HAPs and area sources of HAPs in the statute. If Congress felt it appropriate to make that distinction, it is not appropriate that EPA failed to acknowledge the distinction and provide appropriately proportional standards for them. Area sources of HAP, such as Sunflower's existing H1 and permitted H2, simply do not present as serious a threat to human health as do major sources. Congress acknowledged and allowed for that unassailable fact when it adopted the CAA, and at a minimum, area sources should be provided an additional three years to plan, permit, and construct the requisite control technology necessary to come into compliance. It

⁷ 5 U.S.C. § 601, et.seq

is further likely that, just as with other rulemakings (e.g., the RICE rule), different numerical or work practice standards are appropriate for area sources of HAPs. EPA would have provided the opportunity for small entities to make such demonstration had they followed their own regulatory requirements.

In view of the short time period provided to respond to this exceedingly complex rulemaking, the lack of complete and accurate information explaining the proposal included in the dockets, and the agency's failure to follow its own procedures for garnering small entity input, Sunflower strongly recommends that EPA at the very least consider providing an extended period for supplemental comments, and/or reconsideration of and reproposal of portions of the rule. The proposal itself is complex and requires analyzing many underlying documents directed at MACT standards, individual HAP health effects, monitoring and compliance obligations, and work practice standards. In many cases it is at best to ascertain how the agency arrived at the regulatory conclusions proposed in this rulemaking. In view of the complexity and confusion associated with this rulemaking and supporting information or lack thereof contained in the docket, the 60-day comment period was simply not adequate time to allow complete and intelligent comment on this proposal. Even EPA's 30-day extension, given the nature of the changes to the rule because of identified errors in the EPA-process, is not adequate for a thorough public comment.

We appreciate your attention to these comments and are prepared to meet with you to discuss any matters raised herein at your convenience. Please contact Wayne Penrod for additional information or with any questions.

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Comments to EPA Technical Staff – July 13, 2011 Washington, DC

Members of the National Rural Electric Cooperative Association (NRECA) and the American Public Power Association (APPA) met with representatives of a special Small-Business panel convened by EPA to listen to concerns that small business had relating to the pending Greenhouse Gas rulemaking that had been proposed for July, 2011. A representative of Sunflower was among those present. The materials attached were presented and discussed to demonstrate the concerns we had with suggestions about EPA's plan being discussed in the media.

New units – EPA is to propose an efficiency-based carbon dioxide (CO₂) New Source Performance Standard (NSPS) for new electricity generating units (EGUs). This proposal would impact any new unit for which construction has not been initiated as of the date of proposal.

Existing units – EPA is also expected to propose an emissions budget for each state that represents some presupposed efficiency improvements that EPA suggests can be made at each existing EGU. The proposed rule would ultimately impact the operations of each existing EGU when fully implemented. We understand that EPA has anticipated that existing EGUs can reduce their CO₂ emissions by 5% under their plan.

Regulatory Impact on Efficiency – EPA regulations (final, proposed, or soon to be proposed) all have a negative impact on operating efficiencies of most EGUs. That is, the requirement to install a cooling tower reduces both the capacity and the efficiency of any EGU. Similarly, the installation of air pollution control technology increases the energy consumed in production, thus reducing the net energy output for each unit of fuel consumed. We do not know how EPA will provide for efficiency targets for units impacted by these required improvements.

Operating Impact on Efficiency – EGU unit efficiency is further impacted by a host of planning, operational, and maintenance factors that can be reviewed using continuous emission monitoring data reported quarterly to the EPA. We provided three examples of such impacts for discussion with EPA in the aforementioned meeting:

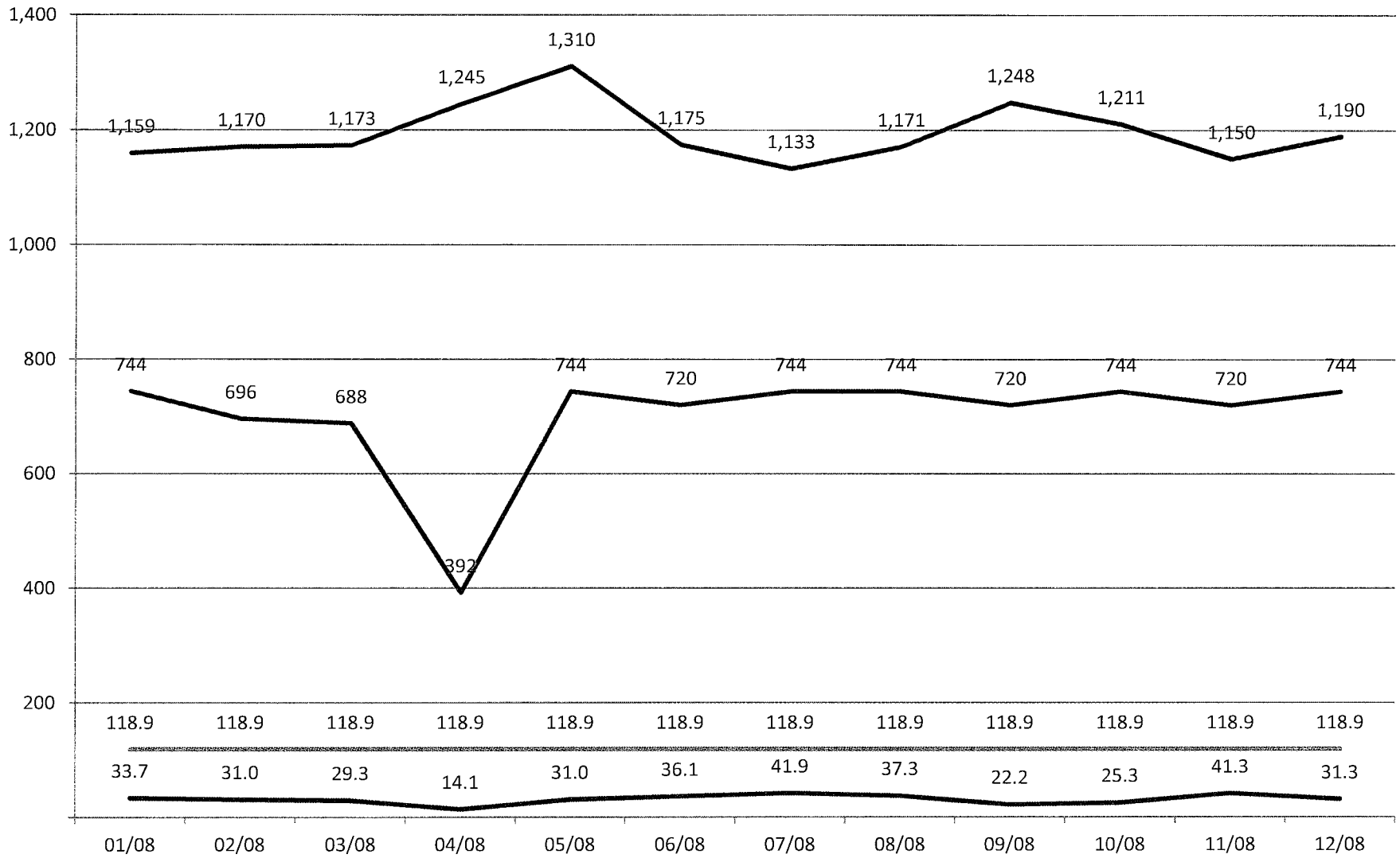
- **Fort Dodge** – a 140-MW **natural gas-fired** unit located near Dodge City that is operated by Sunflower. The design full-load heat rate is about 10,000 Btu/kWh. Fort Dodge operates year-round to meet system load for Mid-Kansas Electric Company, LLC member cooperatives. Because it operates year-round it falls to Fort Dodge to balance the PPA agreements for coal-based energy from Jeffrey

Energy Center and wind energy generation from Gray County and Smoky Hills Wind Farm. The combined impact of planning, operational, and maintenance increases the heat rate about 20% to about 12,000 Btu/kWh.

- **San Miguel 1** – a 390-MW **lignite-fired** unit located south of San Antonio that is operated by San Miguel G&T. The design full-load heat rate is about 11,000 Btu/kWh. San Miguel operates year-round to meet system base load requirements for San Miguel member cooperatives. In 2008 San Miguel 1 experienced a sudden startup failure of an internal steam turbine component installed during a turbine maintenance outage. The maintenance-related failure caused a heat rate deviation of about 10% for the seven months following the component failure. Manufacture of replacement components, summer must-run operating conditions, and scheduling replacement power necessitated the delay in making necessary repairs.
- **Genoa 3** – a 380-MW **coal-fired** unit located south of La Crosse Wisconsin that is operated by Dairyland Power Cooperative. The design full-load heat rate of this super-critical EGU is about 9,250 Btu/kWh. Genoa 3 operates year-round to meet system load for Dairyland member cooperatives. Dairyland initiated a wind energy PPA in early 2009, and Genoa 3, because it operates year-round, balances the PPA agreement much as does Fort Dodge. The combined impact of planning and operational affects increased the heat rate about 11% to about 10,600 Btu/kWh.

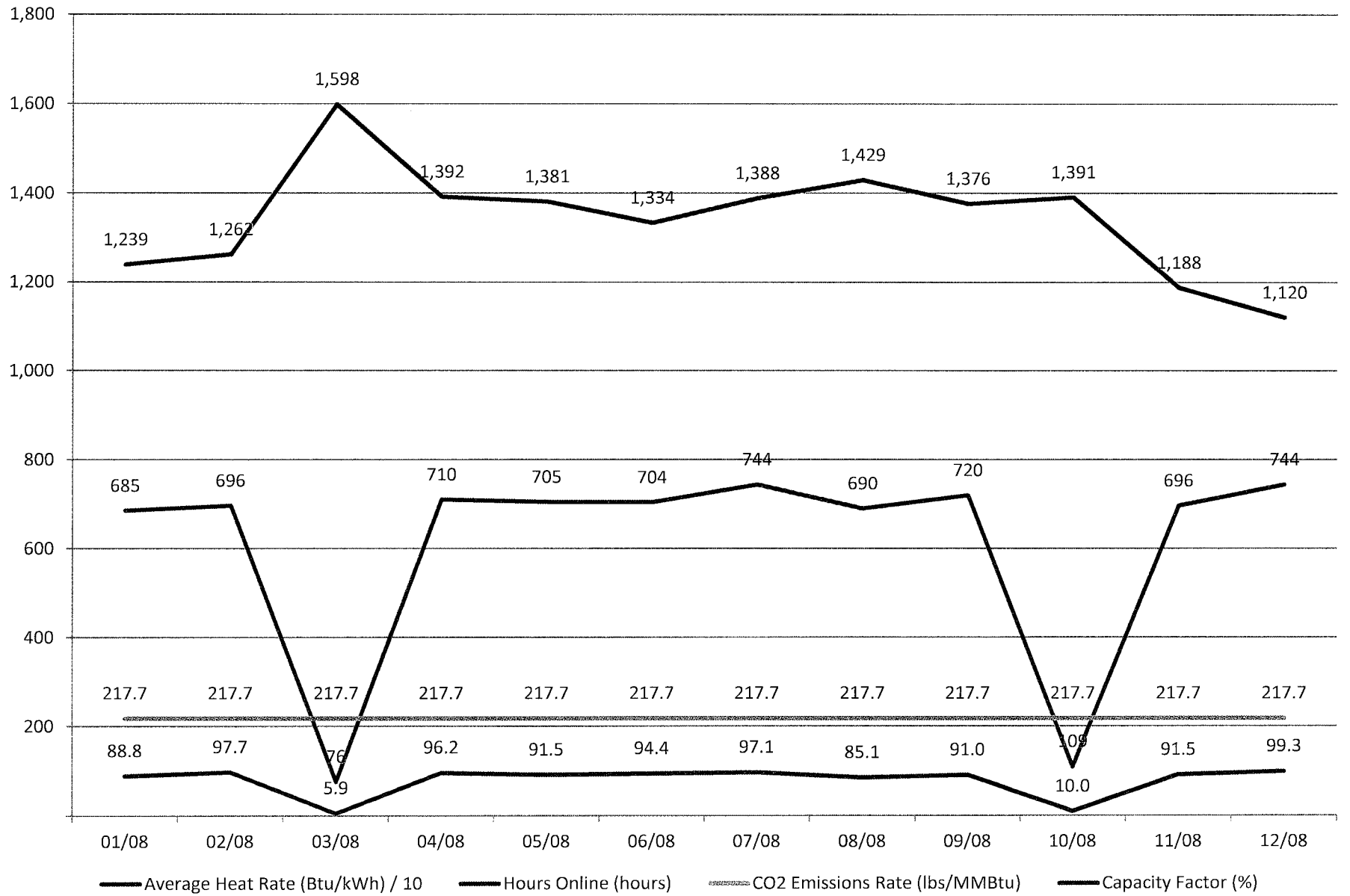
After receiving this information EPA revised it rule proposal date to take into consideration the impact their proposed regulation would have on small businesses. We conclude that the information presented caused them to re-evaluate achievable performance they were considering for the rulemaking. We do not have a revised date for the proposed rule publication in the *Federal Register*.

Fort Dodge - 2008



Average Heat Rate (Btu/kWh) / 10
 Hours Online (hours)
 CO2 Emissions Rate (lbs/MMBtu)
 Capacity Factor (%)

San Miguel - 2008



Genoa 3 - 2009

