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Assistant Administrator Gina McCarthy
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
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Re: *Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals*, 76 Fed. Reg. 48208
(August 8, 2011)
(Docket No. EPA-HQ-OAR-2009-0491) (the "Transport Rule")

and

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
(May 3, 2011)
(Docket No. EPA-HQ-OAR-2009-0234) (the "EGU-MACT Rule")

Dear Administrator McCarthy:

We appreciate the time you and your staff spent with Dennis Welch, John McManus and me on October 7 and the agency's continuing interest in understanding the concerns that we have expressed over the potential impacts of the Transport Rule and the EGU-MACT Rule, including the potential impacts on electric reliability, and your willingness to consider alternatives that can address these concerns. As you know, the operating companies of the American Electric Power system ("AEP") raised these concerns in the comments they submitted on each of the proposed rules, and in their petition for reconsideration of the Transport Rule.

We also have been in contact with the Department of Energy ("DOE"), the Federal Energy Regulatory Commission ("FERC"), our state public service commissions and environmental agencies, the regional transmission organizations ("RTOs") in which we participate - PJM and the Southwest Power Pool ("SPP") – and the North American Electric Reliability Corporation ("NERC"). Our intent has been to discuss the

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implications of these rules for electric reliability and to seek the assistance of these organizations in understanding how they will address the potential conflicts that may arise between strict compliance with these new environmental regulatory requirements and our existing tariff and statutory obligations to provide reliable electric service. Our concern is that strict enforcement of the environmental standards will threaten the ability of generators, transmission owners, and RTOs/ISOs to maintain compliance with the reliability standards developed and administered by the FERC and NERC. As we have considered the overall complexity of the bulk electricity system and the number of variables that impact the reliability of that system, it has only served to increase our concerns.

Based on these conversations and the preliminary work done by AEP, SPP and PJM, we believe there are three primary areas where action is needed to assure that both EPA's environmental goals and the need for electricity security and reliability can be met: (1) prior to finalization of the EGU-MACT, a comprehensive reliability assessment is needed to identify and preliminarily address apparent reliability contingencies through early determinations of extensions for impacted units to allow continued operation while they complete the installation of controls or reliability improvements, including but not limited to construction of replacement generation; (2) iterative analyses should be performed on at least an annual basis to assure that unanticipated delays, synergistic impacts, and new information can be taken into account and provide additional flexibility where needed through a "safety valve" mechanism; and (3) emergency authority should be considered to quickly address short-term needs that result from control equipment malfunctions, unforeseen extended outages, transmission failures, or other circumstances that have immediate impacts on reliability.

An Initial Comprehensive Analysis of Reliability Impacts Could Be Performed to Inform Compliance Schedules for the EGU-MACT

The reliability analyses performed prior to finalization of the Transport Rule and in support of the proposed EGU-MACT Rule focused on generating capacity only – analyzing the amount of generating resources available, and their ability to meet prescribed reserve margins within each region after implementation of the EPA rules. As AEP and others have noted, these analyses failed to consider the multitude of critical reliability services provided by the existing generating units in each region, did not take into account local transmission constraints, and failed to analyze the local reliability impacts of unit retirements or idled units that could not be equipped with required controls within the time available under the rules. SPP has submitted its own studies to EPA showing that under certain scenarios, SPP's reserve operating margins could be severely compromised. PJM has also expressed its concerns to the EPA about local reliability issues which will arise due to the sudden retirement of generating units under the proposed regulations.

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The analyses completed to date, however, have been based on inadequate information and limited modeled projections. The ISO/RTOs and the reliability organizations in non-RTO regions could perform a more accurate and detailed comprehensive assessment using the unique characteristics of the generation and transmission facilities in their own regions and preliminary compliance planning information provided by generators within those regions. Such information should include:

- Identification of units that will be installing additional pollution control equipment and a realistic schedule for completion of that work (including time for commission approval and permitting, if required);
- Identification of changes in fuel mix that can reasonably be accommodated and a reasonable schedule for any needed modifications or approvals to support those changes;
- Permit requirements that constrain the current operation of any existing unit and any planned changes to eliminate or mitigate those constraints with the schedule for securing those changes;
- Outage periods currently scheduled to support ongoing unit operations and any planned installation of controls or other changes;
- New units scheduled to be completed within the planning period and their in-service dates;
- Transmission upgrades or other mitigation measures intended to address existing or anticipated needs within the planning period.

AEP estimates that the Transport Rule and EGU-MACT Rule will require it alone to retire approximately 5,200 megawatts (MW) of generating capacity by 2015. Nationwide estimates have varied between 40,000 to 80,000 MW. It is important to know with greater certainty not just the gross estimate of retired MWs, but the locations where these resources will no longer be available. A comprehensive reliability analysis will not only analyze the adequacy of capacity within each region, it will also consider the types of ancillary services provided by existing and planned generating units and the transmission improvements needed as these changes occur. Most of the units which are negatively impacted by the proposed regulations provide critical ancillary services to the grid which often cannot be eliminated without mitigation. The following services can be replaced over time, but the key factor is having adequate time to make the necessary replacement investments:

- Voltage and reactive load support: The complexity and size of localized grids and the fact that electricity cannot be transmitted over long distances without support to keep voltage and reactive load at required levels drives a need for generating resources in particular locations. Many of the generating units most likely to be retired early often provide this localized support. AEP has been working to address these needs to meet planned unit retirement dates.

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However, our ability to complete these projects in time to meet an inflexible early retirement date is of great concern.

- Unit frequency response: The entire U.S. bulk electricity system – from the largest generating unit to the smallest home appliance – is designed to operate at a frequency of 60 hertz. Frequencies greater or less than 60 hertz have destructive effects on motors and equipment of all sizes and types. Steam turbines typically are best positioned to respond quickly when frequency corrections are needed.
- Load following: Subcritical steam turbine units tend to have a large load range and are able to respond to minute-by-minute changes in load demands. Combustion turbines are significantly less efficient when they operate at less than full capacity and permit restrictions often prevent sustained low-load operation at these units. Because of these characteristics, their load range is small, making them less ideal and uneconomical to respond to these changes in demand.
- System restoration or blackstart capability: In the event of a system brownout or blackout, load rejection capability allows units to rapidly shed load to an islanding condition (separate from the grid). This capability then allows the generator to reconnect and quickly help restart an electric grid that has gone down. Thirteen of AEP's 17 black start-capable units also have automatic load rejection capabilities. All 17 of these units would be prematurely retired under the proposed EGU-MACT Rule.

Because of the complex nature of the services provided, and the localized nature of the grid impacts, unit retirements can cause regional reliability violations that cannot be cured without localized transmission upgrades. Typically when a need for specific services like blackstart capacity is identified as a result of a unit retirement in an RTO region, the RTO will issue a public solicitation for replacement resources, and independently evaluate those alternatives before a remedy is identified. This can take up to several months to complete. Then, depending on the responses to the solicitation and the site-specific technology chosen to replace these resources, it could take between 18 months to five years to put adequate localized measures in place to address these needs, which could include constructing new generation.

AEP has been actively identifying such issues on its own system. Some of the necessary mitigation projects are currently underway, and others may be completed in time to meet the EGU-MACT deadlines. However, there are cases where the loss of ancillary services that these units provide to the grid in their areas cannot be addressed in this short period of time. For example, although four transmission projects at a cost of over \$60 million have been completed thus far as part of AEP's own advance resource planning, eight more known projects remain. It has been estimated that these remaining transmission mitigation projects can be completed by the beginning of 2017 at a cost of

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an additional \$440 million. However, it is obvious that some mechanism is needed to allow continued operation of a small set of units until these actions can be completed.

Historically, reliability assessments have been conducted by examining system contingencies under peak load conditions. The mitigation efforts necessary to meet the timing of the proposed regulations will require an unprecedented number of unit outages in the non-peak periods, and with substantially smaller reserve margins. From a reliability standpoint, this means that even in traditional shoulder load periods, there may be situations where grid reliability is threatened due to a significantly higher outage scenario combined with normal weather changes such as an 85 degree day in October or April. Therefore, assessments of a larger range of operating days will be required to adequately assess the impacts of the EPA rules.

An initial comprehensive assessment should be completed before the EGU-MACT is finalized to allow EPA to know with some degree of confidence where and how many extensions are required to fully implement the rule, and provide the assurance that such extensions will be readily available. If EPA cannot extend the deadline for issuance of the final rule to accommodate this assessment, EPA should establish an effective date for the EGU-MACT that is 12-18 months after publication of the final rule, in order to allow time for the initial assessments to be completed and appropriate extensions to be granted. This should include not only the initial one-year extension available through the permitting authorities, but assurance that the national security and other implications of an imbalanced or weakened electricity grid will justify additional Presidential action.

Additional Iterative Assessments May Identify the Need for Modified Deadlines That Could be Addressed through A "Safety Valve"

There are additional external factors which will impact reliability in a dynamic fashion, as the requirements of the EPA rules are being implemented. Some of these include:

- Unanticipated outages: On several occasions in recent years, baseload nuclear units have been confronted with unanticipated conditions that caused extensive outages. Severe weather also has produced transmission constraints and other equipment damage which required prompt action to assure restoration of electric service within a reasonable period of time.
- Additional unit retirement notifications: Each RTO has a different notice period for unit retirements, with PJM's being 90 days. Conditions unrelated to the EPA rules could prompt notification of additional unit retirements that were not originally anticipated, which could drive a need for alternative or additional mitigation measures.

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- Permitting delays: Recent experience with permitting at new and existing coal plants has shown that even simple permits for new pollution control projects can be delayed by local opposition. More extensive permitting for new replacement capacity or transmission upgrades needed to mitigate reliability impacts can also be significant.
- State commission approvals: In many jurisdictions it is unlawful for a utility company to commence construction in advance of receiving a certificate from the public service commission. In most jurisdictions, it would also be unwise to proceed in advance of state commission approval, since frequently alternative compliance options are required to be investigated during such proceedings and can lead to significant changes in technology choice and design. This could directly impact the time frame for compliance.
- Qualified labor availability: If all generation and transmission owners need to construct improvements simultaneously, it will create a severe shortage of skilled labor necessary to meet the proposed deadlines.
- Material procurement: Manufacturing capacity for many of the required resources is limited both domestically and world-wide, and competition for available capacity and inventories is intense. Overpressure by simultaneous demands for these resources will also increase the cost of compliance.

These circumstances and other variables can directly impact the nature and timing of both compliance activities and proposed reliability solutions. As a result, the initial comprehensive assessment should be followed by iterative re-assessments that look beyond any single unit retirement and take into consideration on a comprehensive basis how each company's compliance and mitigation plans interplay with the actions of other companies throughout the entire footprint of each reliability region. A "safety valve" mechanism such as the one suggested by the joint RTO letter could be used effectively to deal with these implementation issues.

Emergency Relief May Also Be Required

The impacts of the EGU-MACT Rule could be much more extreme, given the stringency of the emission rates proposed and the short averaging times assigned to these limits. If, as anticipated, a large number of smaller older units are retired, the remaining large well-controlled units will need to operate flawlessly in order to remain in compliance, and there will be a much smaller reserve margin available. Because the proposed standards, unlike existing New Source Performance Standards and most State Implementation Plan requirements, apply at all times, including start-ups, shutdowns, and malfunctions, it is much more likely that during periods of peak demands a unit operator will be faced with a dilemma. The unit will either need to continue operating and hope to address an operational upset while on-line, or shut down in an effort to avoid exceeding an applicable emission rate. This dilemma would be exacerbated during periods such as the summer of 2011, when every available generator was called into service during

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periods of extreme heat in the Southwest, and operators were asked to seek approval from environmental regulators to allow continued operation when control equipment was malfunctioning in order to avoid loss of service to firm power customers.

Our limited experience with such situations indicates that no advance assurances are available from any state environmental agency or from EPA for anticipated non-compliance with a short-term emission rate, even when electricity reliability will be compromised. We have in the past removed units from service in such situations in order to maintain compliance with our environmental obligations. But our fear is that because the frequency and severity of the impacts on reliability were never examined, and the stringency of and lack of exceptions in the EGU-MACT standards have never before been applied to our industry, these new requirements will force operators to confront such dilemmas more frequently, and the size of the units affected will have much greater implications for electricity reliability than previously experienced.

We urge EPA to consider these potential implications of its standards, and reconsider the decision to make the short-term emission rates apply during start-up, shut-down and malfunction periods, or seek more detailed information about actual operations during such periods. If the standards cannot be reformulated to accommodate these broader operating ranges, we believe some provision for addressing situations such as the one described above should be included in the final rule.

Conclusion

We encourage EPA to examine all of the options offered by commenters to increase the flexibility of the standards and provide sufficient time for implementation, and devise a system that provides a greater opportunity for advance determinations to provide compliance extensions for all units that may impact the reliability of the bulk electric system. This would encompass not only an exemption for individual retiring units, but should include a more comprehensive advance assessment of the broader impacts on reliability by the RTOs and reliability coordinators based on information provided by generators and transmission owners. AEP has offered a number of suggestions to increase the flexibility of the EGU-MACT, including: (i) a subcategory for smaller units scheduled for retirement that can be phased in over a 6-year period; (ii) mass-based facility-wide emissions averaging; (iii) work practice standards for start-up shut-down and malfunction periods; and (iv) annual averaging. In addition, AEP's petition for reconsideration of the Transport Rule has identified a number of issues, including infeasibility of installing controls, limits on fuel switching, permitting delays and state commission approvals, and failure to consider the historic operation of reliability critical units, which should all be addressed in corrections to the final rule and expand the state budgets in several states. None of these changes will completely eliminate the need for a comprehensive examination of the implications of the full suite

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of EPA regulatory actions on electricity reliability, which we encourage EPA to undertake prior to finalizing the EGU-MACT.

Very truly yours,



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cc: Lorie Schmidt, Office of Air & Radiation, US EPA
Dennis Welch - EVP & Chief Administrative Officer, AEP
John McManus, VP Environmental Services, AEP