

FEDERAL ENERGY REGULATORY COMMISSION

WASHINGTON, D. C. 20426

August 1, 2011

The Honorable Lisa Murkowski
Ranking Member
Committee on Energy and Natural Resources
Dirksen 304
United States Senate
Washington, D.C. 20510

Dear Senator Murkowski:

Thank you for your May 17, 2011 letter regarding the potential reliability implications of the Environmental Protection Agency's ("EPA") proposed rules and any work that the Federal Energy Regulatory Commission ("Commission") may have undertaken in this area.

As described in the attached documents, Commission staff made an informal assessment of the reliability impacts of the proposed rules, but they have not conducted any full studies for a variety of reasons. First, it is important to note that staff's informal assessment necessarily included assumptions of what the EPA regulations would require. Only one of the EPA regulations is yet final, and the informal assessment was performed before that regulation was finalized, and before some of the other regulations were formally proposed.

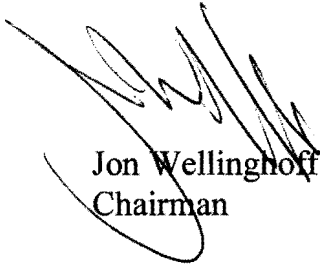
Second, staff's informal assessments used only publicly available data. In some cases, generation retirement decisions may not even have been made by the generation owners. Consequently, an in-depth analysis could not be conducted because complete information was not available.

Third, at meetings with EPA, Commission staff emphasized that the appropriate vehicles for addressing the impact on electric reliability of the EPA rules in detail are the planning processes used by utilities to identify and plan for the infrastructure and resources they will need to meet future needs. These processes have all the necessary data and tools for such analyses. In comparison, the data and tools available to FERC are more limited. Therefore, this informal assessment offered only a preliminary look at how coal-fired generating units could be impacted by EPA rules, and is inadequate to use as a basis for decision-making, given that it used information and assumptions that have changed.

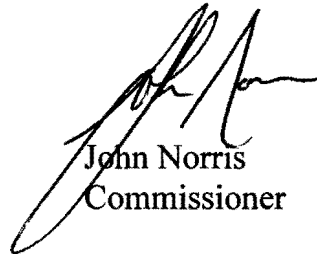
Finally, it is important to note that available data indicates that industry has added significant amounts of generating facilities when circumstances warranted.

If the Commission can be of further assistance on this or any other Commission matter, please let us know.


Sincerely,



Jon Wellinoff
Chairman



John Norris
Commissioner



Cheryl LaFleur
Commissioner

FERC Response to Senator Murkowski Proposed EPA Rules

1. With respect to the impact on electric reliability of the listed EPA rules affecting generation of electric power, please list and describe the Commission's actions taken; studies conducted; assistance provided to any other agency, including EPA; collaborative efforts with any other agency; and provision of data to any other agency.

Answer: Commission staff and individual Commissioners have consulted with EPA and other agencies. Also as described below, the Commission has not conducted any full studies on the EPA rules, but Commission staff has made an informal assessment of the reliability impacts of EPA's rules (copy provided).

Limited Scope of Commission Staff's Informal Assessment

At meetings with EPA, Commission staff has emphasized that the appropriate vehicles for addressing the impact on electric reliability of the EPA rules in detail are the planning processes used by utilities to identify and plan for the infrastructure and resources they will need to meet future needs.¹ These processes have all the necessary data and tools for such analyses. In comparison, the data and tools available to both EPA and FERC are more limited. Commission staff has also identified relevant issues that can and should be addressed within these processes. Further, staff's informal assessments used only public data.

It is important to note that staff's informal assessment necessarily included assumptions of what the EPA regulations would require. Only one of the EPA regulations is yet final, and staff's informal assessment was performed before certain of the regulations were proposed. On this point, a June 2011 report issued by staff of the Bipartisan Policy Center concluded that:

scenarios in which electric system reliability is broadly affected are unlikely to occur. Previous national assessments of the combined effects of EPA regulations reach different conclusions, in part because they make quite different assumptions about the stringency and timing of new requirements and about the availability and difficulty of implementing control technologies. In some cases these assumptions deviate from the specifics of EPA's recent proposals in meaningful ways. Moreover, market factors, such as low natural gas prices, are as relevant as EPA regulations in driving coal plant retirements.^[2]

¹ The planning authorities include, but are not limited to the Midwest Independent Transmission System Operator, PJM Interconnection, LLC, the California Independent System Operator, and Tennessee Valley Authority.

² Bipartisan Policy Center, Staff Paper: Environmental Regulation and Electric System Reliability (June 13, 2011).

This statement is equally true of staff's informal assessment. As noted, Commission staff's informal assessment was based on information that was publicly available at the time it was conducted and included assumptions regarding the potential EPA rules that have changed during the EPA rulemaking process and may continue to change. While that informal, preliminary assessment showed 40 GW of coal-fired generating capacity "likely" to retire, with another 41 GW "very likely" to retire, an in-depth analysis could not be conducted because complete information was not available. In performing the informal assessment, Commission staff chose certain factors to consider, such as SO₂ controls, age of the plant, and whether the plant owner had already announced plans to retire the plant. Commission staff then decided to weight each factor. As these inputs to the informal assessment have changed, projected outcomes would necessarily change. Therefore, this informal assessment offered only a preliminary look at how coal-fired generating units could be impacted by EPA rules, and is inadequate to use as a basis for decision-making, given that it used information and assumptions that have changed.

Commission staff's informal assessment of the proposed EPA regulations was performed based on assumptions of what the EPA regulations might require. For example, similar to other national studies performed at the time, staff's informal assessment assumed that the steam generating units employing once-through cooling systems could be required to replace their cooling water systems with closed-loop cooling systems.³ However, EPA states that under its proposed rules, closed-loop cooling systems are not required of existing facilities and that "in meeting the impingement requirement that a limited number of fish be killed by a facility, the facility would determine which technology to employ to meet the impingement limit."⁴

Consultations

Commission staff has had numerous consultations with EPA concerning its proposed power sector rules. Staff also has participated in meetings attended by the Council on Environmental Quality (CEQ), Department of Energy, and the EPA. Each consultation generally concerned a single proposed rule, rather than the cumulative effect of all of the EPA proposed rules. Commission staff's discussions with EPA staff were primarily with EPA's air quality staff and concerned EPA's air quality rules.

Commission staff discussions with EPA and other agencies generally concerned the EPA's analysis of its various upcoming rules – particularly their effects on power plants and grid reliability. At some of these meetings, outside studies as well as FERC's and EPA's assessments of the impacts of the individual potential EPA rules were discussed. The agencies discussed the underlying approach to EPA's analysis and potential limitations of the analysis, and next steps.

³ See, e.g. NERC Assessment at 2.

⁴ EPA, Clean Water Act Section 316(b) Existing Facilities Proposed Rule: Qs and As (March 28, 2011).

In a meeting with EPA and CEQ at Commission Headquarters on October 27, 2010, Commission staff discussed the results of its informal assessment of projected coal generation retirements, which included an explanation of the assessment's methodology. As discussed above, this informal assessment had several limitations. The informal assessment of reliability impacts was based on information that was publicly available at the time it was conducted and included assumptions regarding the potential EPA rules that have changed during the EPA rulemaking process and may continue to change. While that informal, preliminary assessment showed 40 GW of coal-fired generating capacity "likely" to retire, with another 41 GW "very likely" to retire, an in-depth analysis could not be conducted because complete information was not available. In some cases, generation retirement decisions may not even have been made by the generation owners. In performing the informal assessment, Commission staff chose certain factors to consider, such as SO₂ controls, age of the plant, and whether the plant owner had already announced plans to retire the plant. Commission staff then decided to weight each factor. As these inputs to the informal assessment have changed, projected outcomes would necessarily change. Therefore, this informal assessment offered only a preliminary look at how coal-fired generating units could be impacted by EPA rules, and is inadequate to use as a basis for decision-making, given that it used information and assumptions that have changed. This assessment was not transmitted to the EPA or CEQ either in paper form or electronically. EPA and CEQ staff questions centered on the amount of generation that might be affected, its impact on the reliability of the power grid, the methods by which the data was acquired, the weighting of the factors, and the basis used for conclusions on which units would be considered at-risk for retirement.

Commission staff, CEQ and EPA also discussed the effect of planned and needed new generation to compensate for the reliability impacts of retirements, the ability of such new generation to come online before the retirement of coal units is expected to begin between 2015 and 2018, the deliverability of new generation, the issues regarding single-source fuel dependencies, and finally which EPA regulations were most likely to be implemented within the near future.

In subsequent discussions with EPA, Commission staff discussed the generation investment strategy used by the industry and why Commission staff believes that a comprehensive approach is needed when studying the impacts of the EPA rules. EPA and Commission staff discussed various scenarios concerning replacing retired generation with renewable resources, including that renewable generation may not provide a one-to-one replacement for retiring capacity given the unique characteristics of different generation types and their impact on grid stability.

In discussing whether there is enough time for new generation to come online by 2018 to offset coal retirements, Commission staff identified several factors that can extend the project build horizon. These include the long lead time needed for some equipment, potential protests against pipeline siting and construction, transmission siting and construction issues, and environmental permitting. These factors may slow the industry response in replacing retired units.

In discussions concerning the EPA efforts to model the effect these regulations could have on generation retirements, Commission staff recommended that such efforts should include the modeling of transfer limits, placement and timing of capacity additions and the cumulative impact of all the upcoming EPA regulations. Specifically, the Commission staff identified the following reliability considerations: (1) regional resource adequacy, (2) deliverability and transmission flows on the grid, (3) black start units and (4) voltage and frequency response.

Importantly, Commission staff has emphasized that the appropriate vehicles for addressing these issues are the planning processes used by utilities to identify and plan for the infrastructure and resources they will need to meet future needs.⁵ These processes have all the necessary data and tools for such analyses. In comparison, the data and tools available to both EPA and FERC are limited and incomplete.

At least one staff discussion with EPA staff focused on Commission approved public utility tariff rules relating to generation retirements. Commission staff discussed public utility tariff requirements for reliability-must-run generation, generation retirements and related Commission decisions. Commission staff later sent EPA information detailing FERC policies and key orders that explain those policies.

In addition to the staff consultations, certain Commissioners also met with representatives from EPA. On December 17, 2010, Chairman Wellinghoff met with Administrator Jackson at EPA regarding the proposed rules. Chairman Wellinghoff also had a phone conversation with Gina McCarthy, Assistant Administrator for the Office of Air and Radiation, on the morning of October 26, 2010 to discuss NERC's report on the reliability impacts of EPA's regulations. On November 29, 2010, Commissioners Norris and LaFleur and their staffs met with Ms. McCarthy and other EPA staff. The meeting consisted of an overview and discussion of EPA's current Clean Air Act rulemaking activities. On May 3, 2011, Commissioners LaFleur and Moeller and their staffs met with Ms. McCarthy, other EPA staff, and staff from DOE. The subject matter of this meeting concerned the EPA's proposed rules and their potential impacts in terms of cost and reliability, specifically discussing the analyses that EPA has performed to try and quantify these impacts.

2. Regarding collaborative efforts between FERC and EPA described above, has an Inter-Agency Task Force been established? If so, please state or provide:
- a. the date it was established;
 - b. the source of its authority;
 - c. a copy of its charter;
 - d. a description of the scope of its work;

⁵ Some of the larger planning authorities are the Midwest Independent Transmission System Operator, PJM Interconnection, LLC, and the California Independent System Operator.

- e. a schedule of its meetings, including a list of its meetings to date and any planned meetings;
- f. any minutes of its meetings; and
- g. a list of the agencies and agency officials participating.

Answer: While Chairman Wellinghoff has stated that he believed that an Interagency Task Force was being formed, he was broadly referring to the informal consultations described in response to question number 1. The Commission has not participated in any interagency task force or other working group to address the impact of EPA's proposed power sector rules. All meetings attended by Commission staff concerning the proposed rules are summarized in response to question number 1.

3. Please describe all work being jointly performed by FERC staff, including work done in collaboration with EPA – whether in connection with an Inter-Agency task force or otherwise – regarding the potential impact of EPA regulations on the retirement of electric generating units and, to the extent such information has been developed, the specific type and characteristics of units that may face retirement as a consequence of such regulations.

Answer: The only work performed by Commission staff is discussed above in response to question 1. Commission staff has not performed any work jointly with any other agency regarding the potential impact of the EPA regulations. As explained in response to question 4, Commission staff performed an informal assessment of projected coal generation retirements.

4. Please describe FERC's efforts to explain the effect of potential retirements on electric reliability. If research, data, or analysis has been developed by or supplied to FERC, please provide it. If no analysis has been conducted, please explain why.

Answer: Commission staff performed an informal assessment of projected coal generation retirements. The informal assessment was based on information that was publicly available at the time it was conducted. While that informal, preliminary assessment showed 40 GW of coal-fired generating capacity "likely" to retire, with another 41 GW "very likely" to retire, an in-depth analysis could not be conducted because complete information regarding the specific units planned for retirement is not available. In some cases, generation retirement decisions may not even have been made by the generation owners. In performing the informal assessment, Commission staff chose certain factors to consider, such as SO₂ controls, age of the plant, and whether the plant owner had already announced plans to retire the plant. Commission staff then decided to weight each factor. As these inputs to the informal assessment have changed, projected outcomes would necessarily change. Therefore, this informal assessment offered only a preliminary look at how coal-fired generating units could be impacted by EPA rules, and is inadequate to use as a basis for decision-making, given that it used information and assumptions that have changed. This assessment was not transmitted to

the EPA or CEQ either in paper form or electronically. EPA and CEQ staff questions centered on the amount of generation that might be affected, its impact on the reliability of the power grid, the methods by which the data was acquired, the weighting of the factors, and the basis used for conclusions on which units would be considered at-risk for retirement.

5. Please describe fully FERC's powers to protect electric reliability in the event of plant retirements, and what measures FERC plans to take to ensure electric reliability or an explanation of why such measures have not been devised. Please provide the following assessments, or an explanation of why such assessments have not yet been devised:

- a. an assessment of generation adequacy in the face of retirements of significant generating units in transmission-constrained areas;
- b. an assessment of the effect of retirements of generating units in organized markets for energy and capacity (e.g. on prices and unit commitment); and,
- c. a general assessment of the capacity to permit and construct new electric generation units in a timely manner such that electric supplies from retired plants are replaced and anticipated demand growth is met.

Answer: As discussed in response to question 4, Commission staff has only performed an informal assessment of projected coal generation retirements. The informal assessment of reliability impacts was based on information that was publicly available at the time it was conducted. An in-depth analysis could not be conducted because complete information regarding the specific units planned for retirement is not available. In some cases, generation retirement decisions may not even have been made by the generation owners.

Commission staff believes that the appropriate vehicles for addressing these issues are the planning processes used by utilities to identify and plan for the infrastructure and resources they will need to meet future needs.⁶ These processes have all the necessary data and tools for such analyses. In comparison, the data and tools available to FERC staff are limited and incomplete. In addition, section 215 of the FPA does not allow the Commission to order new facilities to be built.

With respect to the Commission's authority to protect electric reliability in the event of plant retirements, the Commission has acted under section 207 of the Federal Power Act to ensure reliability in a case involving the Clean Air Act.⁷ Section 207 states that "whenever the Commission, upon complaint of a State commission, after notice to each State commission and public utility affected and after opportunity for hearing, shall find

⁶ Some of the larger planning authorities are the Midwest Independent Transmission System Operator, PJM Interconnection, LLC, and the California Independent Transmission System Operator.

⁷ The answers to this question concern only the Commission's authority and do not discuss any possible DOE authority.

that any interstate service of any public utility is inadequate or insufficient, the Commission shall determine the proper, adequate, or sufficient service to be furnished, and shall fix the same by its order, rule, or regulation.” Action under section 207 may only be taken after a hearing. This may consist of a paper hearing allowing for comments to be submitted to the Commission. In a 2006 decision, the Commission relied on section 207 to order two utilities to file a long-term plan for transmission upgrades to address reliability concerns raised by the possible shutdown of certain generating facilities pursuant to the Clean Air Act. District of Columbia Public Service Commission, 114 FERC 61,017 (2006). The Commission’s remedy did not conflict with the requirements of the Clean Air Act, and instead reconciled the requirements of the Federal Power Act and the Clean Air Act.

FERC also has approved tariff provisions and agreements allowing system operators to require the continued operation of generating facilities so long as the owners of those facilities are reimbursed for the cost of operating, including any costs incurred in ensuring compliance with environmental rules. In Order No. 890-A,⁸ for example, the Commission stated that:

Reliability problems caused by the lack of available resources should be dealt with through ... means, such as negotiation of must-run service agreements.⁹

Such agreements have been used by Regional Transmission Organizations or Independent System Operators to ensure continued operation of needed facilities while ensuring appropriate compensation for the costs incurred by those units.¹⁰

Similarly, during the California energy crisis, the Commission required generating facilities to run whenever requested by the system operator. However, the Commission

⁸ Preventing Undue Discrimination and Preference in Transmission Service, Order No. 890, FERC Stats. & Regs. P 31,241, order on reh'g, Order No. 890-A, FERC Stats. & Regs. P 31,261 (2007), order on reh'g, Order No. 890-B, 123 FERC ¶ 61,299 (2008), order on reh'g, Order No. 890-C, 126 FERC ¶ 61,228 (2009), order on clarification, Order No. 890-D, 129 FERC ¶ 61,126 (2009).

⁹ Order No. 890-A at P 950.

¹⁰ See, e.g., *ISO-New England, Inc*, 132 FERC ¶ 61,044 (2010); *Exelon Generation Company, LLC*, 132 FERC ¶ 61,219 (2010); *PSEG Energy Resources & Trade and PSEG Fossil LLC*, 111 FERC ¶ 61,121 (2005). See also, e.g., ISO-New England, tariff section III.13.2.5.2.5 (delineating the process for a de-list bid rejected for reliability reasons), PJM Interconnection, tariff section V.113 (governing the generation deactivation process), and California Independent System Operator, tariff sections 41.1 (Procurement of RMR Generation), 41.4 (Reliability Must Run Contracts) and 41.3 (Reliability Studies and Determination of RMR Unit Status).

allowed an exception for purposes of compliance with other applicable law.¹¹ Again, the Commission was able to reconcile the requirements of the Federal Power Act and other laws.

In Order No. 890, the Commission also required certain transparency provisions regarding retired generation, requiring transmission providers to make available, upon request, modeling data concerning the dates and capacities of new and retiring generation as well as new and retired generation included in models for future years.¹²

A completed application for Network Integrated Transmission Service also requires information regarding off-system network resources that include any RMR unit designations required for system reliability or contract reasons.¹³ Again, the Commission has not asserted that this authority can be used to approve violations of environmental laws. Instead, the owners of affected generating facilities were “made whole” for the costs they incurred to continue to operate.

I do not foresee a need to require utilities to operate in violation of federal environmental laws or regulations. As it has in the past, the Commission would seek to find ways to require or allow utilities to operate when needed for reliability or other purposes while being compensated adequately and without violating other federal laws. If future circumstances present an unavoidable conflict between FERC’s authority for the reliability of the power grid and requirements imposed under other federal laws, the appropriate resolution of this conflict will need to be determined at that time. Moreover, available data indicates that industry has added significant amounts of generating facilities when circumstances warranted. As a point of reference, EIA data shows that between 2000 and 2004, an annual average of 38.74 GW of capacity was added nationally, with a peak addition of 58.06 GW in 2002.

6. The Clean Air Transport Rule specifically lists ensuring electric reliability as a “key guiding principle.” Please describe any research, documentation or analysis FERC has provided EPA for this rule.

Answer: *The Commission has not provided EPA with any research, documentation or analysis on the Clean Air Transport Rule, except for discussion of Commission staff’s informal assessment as described above.*

¹¹ See *San Diego Gas and Elec. Co.*, 95 FERC ¶ 61,115 (2001) (“Under a must-run obligation, no generator will be required to run in violation of its certificate or applicable law.”).

¹² *Order No. 890* at P 148.

¹³ Pro forma Open Access Transmission Tariff § 29.2.

7. Regarding the Commission's FY 2010 Performance and Accountability Report to Congress, quoted above, and the staff analysis of electric reliability impacts referenced in the quotation, please describe or provide:

- a. the study and all supporting materials including research;
- b. a list of any other agencies involved in the production of the study with information on their involvement
- c. actions FERC has taken or plans to take based on the study; and
- d. how and where the study has been made public, or why it has not been released

Answer: As discussed in response to question 4, Commission staff performed an informal assessment of projected coal generation retirements. The informal assessment of reliability impacts was based on information that was publicly available at the time it was conducted. An in-depth analysis could not be conducted because complete information regarding the specific units planned for retirement is not available. In some cases, generation retirement decisions may not even have been made by the generation owners. This assessment has not been made public because it is an informal assessment based on available information and is not complete. Materials concerning this informal assessment are attached.

8. In your view, would compliance with EPA or other environmental regulations excuse a violation of FERC-approved electric reliability standards? If so, should the Commission refrain from imposing penalties for these violations?

Answer: The Commission has not seen a circumstance where compliance with EPA or other environmental regulations has caused a violation of FERC-approved electric reliability standards. As it has in the past, the Commission would seek to find ways to require or allow utilities to operate when needed for reliability or other purposes while being compensated adequately and without violating other federal laws. If future circumstances present an unavoidable conflict between FERC's authority for the reliability of the power grid and requirements imposed under other federal laws, the appropriate resolution of this conflict will need to be determined at that time.

9. Please assess whether FERC has sufficient statutory authority to protect electric reliability in collaboration with other federal entities that are undertaking rulemakings.

Answer: Apart from the issue of cyber security and other national security threats and vulnerabilities, I do not see a need for further statutory authority to protect electric reliability at this time.

10. Is FERC or any other agency, to your knowledge, soliciting or relying upon advice or assistance from any entity established pursuant to the Federal Advisory Committee Act?

Answer: No.

APPENDIX A

Meetings with EPA

Below is a list of CEQ and EPA's Clean Air Division (EPA CAD) meetings Commission staff has attended concerning the potential retirement of coal fired generation as a result of the EPA proposed rules. Document descriptions relating to these meetings are attached as an appendix. No physical or electronic copies of FERC's data or analysis were given to EPA. EPA CAD and FERC Staff will continue to meet on an as needed basis.

September 8, 2009 12:30-4:30 PM

EPA Headquarters

Participants: staff from EPA, FERC and members from industry

Meeting to discuss EPA regulatory actions and their effect on the electric generating sector.

August 18, 2010 2:15 PM – 3:15 PM

Meeting at White House Conference Center, Jackson Place

Participants: staff from EPA, CEQ, FERC and others

The Council for Environmental Quality (CEQ) convened a meeting to discuss EPA analysis of upcoming rules affecting power plants and the impacts of the rules on costs, reliability, generation mix, etc. At the meeting, it was mentioned that several outside studies to explore this topic have been completed or are underway. CEQ said it was important for the Administration to develop analytics to provide a coherent and unified view on potential impacts.

EPA presented two alternative scenarios for the power sector, using the Integrated Planning Model (IPM), which illuminates a range of issues including retirements and reliability implications. Discussion on the underlying approach, limitations of the analysis, and next steps ensued. EPA provided an overview presentation of Clean Air Act requirements for the power sector and a timeline of upcoming EPA regulations.

September 8, 2010 2:00 PM-3:00 PM

Meeting at FERC

Participants: staff from EPA and FERC

EPA asked to visit with FERC staff to follow up on the August 18 discussion of the EPA modeling assumptions.

October 5, 2010 2:00 PM – 3:00 PM

Meeting at White House Conference Center, Jackson Place

Participants: staff from EPA, CEQ, FERC and others

CEQ arranged a meeting to discuss assessing the potential impact to the bulk power system from the proposed EPA regulations. FERC staff attended this meeting.

October 20, 2010 1:00 PM – 3:00 PM

Meeting at White House Conference Center, Jackson Place

Participants: staff from EPA, CEQ and FERC

CEQ arranged a follow-up meeting with staff from EPA and FERC to discuss how EPA and CEQ thought FERC might be able to provide perspective on an EPA analysis of the bulk power system. EPA CAD staff has been assessing potential impacts to the bulk power system that stem from implementation of proposed EPA clean air regulations over the next three years. These EPA regulations are the Clean Air Interstate Rules, now known as the Transport Rules.

EPA CAD's analysis focused only on the effects that the Transport Rules would have on the nation's electric generation capacity— specifically the reduction of coal plants. EPA CAD's analysis did not consider the cumulative impact from additional legislative initiatives, including water restrictions, coal ash byproduct sequestration or any renewable generation mandates.

The CEQ proposed that FERC staff meet with EPA CAD staff to further explore EPA CAD's assumptions, data granularity and methodology, and for FERC staff to explain the methodology of its coal generation assessment. There were differences between the results obtained by the EPA CAD assessment and FERC staff informal assessment with respect to the amounts of coal units that might shut down across the country. The overarching goal of this future meeting was to exchange information.

October 26, 2010

Chairman Wellinghoff had a phone conversation with Gina McCarthy, Assistant Administrator for the Office of Air and Radiation, to discuss NERC's report on the reliability impacts of EPA's regulations.

October 27, 2010 10:00 AM – 12:00 PM

Meeting at FERC

Participants: staff from EPA, CEQ and FERC

EPA CAD organized a meeting with FERC staff and CEQ to discuss how proposed EPA regulations that will affect coal plants might affect reliability of the grid and potential methods by which these impacts could be analyzed. Data from EPA's modeling efforts was compared with the results of FERC staff's informal assessment.

The meeting began with a presentation of the FERC staff informal assessment which included detailed explanations of the assessment and methodology used. FERC staff explained that the assessment had data limitations and was based on publicly available information and more information would be needed to have a complete assessment.

Commission staff emphasized that its informal assessment was limited in nature because it made many assumptions regarding what the pending EPA rules may or may not do. The questions asked by attendees about the FERC staff informal assessment centered on the methods by which the data was acquired, the weighting of the factors, data limitations, and the basis used for conclusions on which units would be considered at-risk for retirement.

The group then discussed the potential effect of planned and needed new generation on the reliability impacts of retirements, the ability of such new generation to come online before the retirement of coal units is expected to begin between 2015 and 2018, and finally which EPA regulations were best defined and most likely to be implemented within the near future.

The CEQ representative discussed whether nameplate capacity numbers of proposed generation would show that there would be enough capacity following the fast retirement of a sizeable amount of generation. FERC staff stated that renewable generation may not provide a one to one replacement for the capacity that is retiring given the different characteristics of the units.

The EPA CAD representative discussed timelines for new generation to come online to offset coal retirements. In response, Commission staff identified several factors that can extend the project build horizon, such as long lead time equipment, backlash against pipeline siting and construction, transmission siting and construction issues, along with other factors that could slow the market response. The EPA CAD representative concluded the discussion by stating that the Clean Air Transport Rule and Mercury MACT Rule were closer to being final than the coal combustion residuals or Clean Water Act regulations.

EPA CAD staff concluded the meeting by outlining next steps and planning future meetings for further discussion. The EPA CAD asked FERC staff to evaluate the generation data produced by the EPA CAD model and compare the units that have been predicted to retire by that model with those units designated as at-risk by the FERC staff initial assessment. In addition, they expressed a desire for FERC staff to produce system production cost runs and reliability metric studies using the generation retirement lists created by the EPA CAD model. The CEQ representative also expressed a desire for FERC staff to complete sensitivity studies regarding the major risk factors and begin evaluation of a best case scenario.

November 4, 2010 10:30 AM – 12:00 PM

Conference Call

Participants: staff from EPA and FERC

EPA CAD staff held a conference call with FERC staff as a follow up to the meeting of October 27th. The purpose of the call was to engage further discussion regarding FERC staff initial coal retirement projections, assumptions and methodology with the EPA. At that time, the EPA was only considering the Transport rule which was scheduled to take

effect in June 2011. EPA CAD staff has been seeking assistance from FERC staff in analyzing the effect on reliability of the Maximum Achievable Control Technology (MACT) rule for which they would provide further data as produced by their model in December 2010.

FERC and EPA CAD staff discussed the generation investment strategy used by the industry and the need for a cumulative approach when studying the impacts of the EPA rules.

November 29, 2010 – 2:30-4:00 pm

EPA Headquarters

Participants: Commissioners Norris and LaFleur, FERC staff, EPA: Gina McCarthy, Assistant Administrator for the Office of Air and Radiation, EPA staff

Subject: An overview and discussion of EPA's current Clean Air Act rulemaking activities.

February 10, 2011 3:45 PM – 5:00 PM

Meeting at EPA HQ

Participants: staff from EPA, CEQ, DOE and FERC

EPA convened a meeting to discuss communication strategy. Agenda for this meeting

- Introductions (5+ minutes)
- Status/Update on EPA's Rules (10+ minutes)
- Status/Update on ongoing EPA-FERC meetings (5 to 10 minutes)
- Focus on key next Rules (Toxics Rule will be proposed March 16 and Cooling Water Rule will be proposed March 14), timeline, messaging, and next steps (30+ minutes)

February 14, 2011 Lunch Meeting

Participants: staff from FERC and EPA

EPA staff contacted FERC Staff to request that EPA staff and FERC staff have lunch together during the National Association of Regulatory Utility Commissioners annual meeting. EPA and FERC staff discussed ways in which EPA staff could participate in regional transmission planning processes to monitor how utilities plan to comply with the EPA rules.

February 16, 2011 10:00 AM – 12:00 PM

Meeting at FERC

Participants: staff from EPA, CEQ, DOE and FERC

FERC staff attended a meeting with staff from the EPA CAD, DOE, and CEQ with regard to the implications of the upcoming EPA Transport and Toxics rules. The group

received a presentation of EPA modeling efforts that predicted these regulations could cause the retirement of approximately 9 GW of generation capacity. Concerns regarding the modeling of transfer limits, capacity additions and the cumulative impact of all the upcoming EPA regulations were also discussed. EPA CAD staff sought to work with FERC and DOE staff over the next several months to better identify and address issues that could affect grid reliability. Issues to be addressed included the impact of the upcoming rules on: (1) regional resource adequacy, (2) transmission flows on the grid, (3) black start units and (4) voltage and frequency.

March 14, 2011 8:00 AM – 9:00 AM

Conference Call

Participants: staff from EPA and FERC

FERC staff sat in on a conference call with EPA CAD staff regarding coal plant retirements expected as a result of announced EPA regulations. The EPA CAD staff discussed how they had retooled their analysis, slightly downgrading the amount of expected retirements as a result of the Clean Air rules. The EPA issued the proposed toxics standards on March 16 (two days after this meeting), with a final rule to be issued by November 16, 2011.

FERC staff discussed how the EPA CAD's modeling did not take into account the cumulative effect of its proposed regulations and emphasized that Commission staff does not have the ability to produce such a study. FERC staff shared the suggestion made by industry groups that the regional planning processes would be an excellent place for the EPA to receive further input regarding pending regulations effect on grid reliability. EPA CAD staff proposed to conduct bi-weekly conference calls with FERC to keep each other informed of any developments.

March 30, 2011 8:00 AM – 9:00 AM

Conference Call

Participants: staff from EPA and FERC

On March 24 the EPA released details on the proposed Clean Water Act rule. EPA staff stated that the rule was much less stringent than industry had expected. FERC staff offered to send news articles and other public information to EPA CAD staff as well as list of sources for coal retirement information.

April 4, 2011 11:30 AM – 12:30 AM

Meeting at FERC

Participants: staff from EPA and FERC

At the request of EPA staff, FERC staff met with EPA staff regarding FERC approved public utility tariff rules relating to generation retirements. FERC staff discussed public utility tariff requirements for reliability-must-run generation, generation retirements and related Commission decisions. FERC staff followed-up with a reply email detailing FERC policies and key orders that explain those policies.

April 13, 2011 8:00 AM – 9:00 AM

Conference Call

Participants: staff from EPA and FERC

EPA provided FERC staff a study which was intended to forecast which coal fired power generation units will be retrofitted or retired by 2015 as a result of EPA's recent proposal for Maximum Achievable Control Technology (MACT) standards for hazardous pollutants on electric utility emissions. FERC staff noted EPA modeling inconsistencies and provided information on publicly announced retirements and retrofits that were not taken into account on the EPA study.

April 27, 2011 8:00 AM – 9:00 AM

Conference Call

Participants: staff from EPA and FERC

EPA CAD and FERC staff discussed the EPA's modeling of the EPA's Utility MACT Rule (Toxics Rule). The EPA discussed questions, industry studies and recent retirement announcements that may concern the proposed Toxics Rule. To more fully evaluate industry concerns, FERC staff suggested that the EPA follow up on earlier suggestions to engage in the regional planning process with entities such as PJM, MISO and SERC. FERC and EPA agreed to meet in mid-June to assess any further developments from NERC, regional processes or comments submitted to the EPA.

May 3, 2011

Commissioner LaFleur, Commissioner Moeller, and members of their staffs met with Gina McCarthy, Assistant Administrator for the Office of Air and Radiation, and staff from EPA, along with staff from the DOE.

The subject matter of this meeting concerned the EPA's proposed rules and their potential impacts in terms of cost and reliability, specifically discussing the analyses that EPA has performed to try and quantify these impacts.

APPENDIX B

Files and Data Received From and Shared with EPA

Below is a list of files and data received from and shared with EPA CAD. **No physical or electronic copies of data or quantitative analysis were given by Commission staff to EPA.** Commission staff shared with EPA CAD some questions regarding the IPM model and its results. This is reflected in the April 21, 2011 entry.

General Data

- Coal Retirement Effects on Reliability Final.pptx- This was a presentation prepared regarding FERC's initial analysis of the potential impacts of the upcoming EPA regulations.

Commissioner Cheryl LaFleur

- Cheryl LaFleur.pdf- This contains e-mail correspondence between Commissioner LaFleur's staff and EPA staff.
- EPA Addressing the Environmental Impacts of the Power Sector.pdf – This document was presented to Commissioners LaFleur and Moeller.
- NREL Coal Study.pdf – This is a study done by NREL to analyze potential coal plant retirements due to EPA regulations.
- EPA Reducing Pollution from Power Plants – This presentation was given at the November 29, 2010 meeting with Commissioners Norris and LaFleur.

Michael Bardee

- Michael Bardee.pdf - This contains e-mail correspondence regarding a meeting organized by EPA staff.
- Email.pdf- This contains e-mail correspondence by EPA staff, inviting FERC staff and industry representatives to a meeting.

E-Mails to EPA

Questions and comments

- Database Questions Response.docx - This is the EPA CAD's response to questions they received from OER Staff regarding the IPM model and its results. The file also contains the questions asked by FERC.
- FW Responses to Your Questions.msg – E-mail correspondence regarding the EPA's modeling efforts.
- Re These are some of the questions.msg – E-mail correspondence regarding the EPA's modeling efforts.
- These are some of the questions.msg – E-mail correspondence regarding the EPA's modeling efforts.

Announcements and studies shared with EPA

- (WF) Are Coal And Nuclear Pains Gas' Gains.msg – E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- CITI Report.msg – E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- Coal Retirement Announcements.msg – E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- Dominion plans to sell Kewaunee.msg – E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- EPA rules.msg – E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- FirstEnergy prioritizing.msg – E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- Future of FirstEnergy.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- FW (CITI) Notes from Management Meeting.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- FW Macquarie - Utilities and merchant power.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- Gregoire Signs TransAlta Bill.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- ICF International Integrated Energy Outlook.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- LG&E and KU plan to retire about 800 MW.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- Morris 5 480 MW of AEP coal capacity.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- Southern's Fanning talks EPA1.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.
- UBS Utilities.msg– E-mail correspondence sharing news regarding the impact of EPA regulations on coal generation.

Data received from and shared with EPA

August 18, 2010

- EPA Key Preliminary Results from Modeling Future Utility Controls Aug 18.pdf – This is a presentation given by the EPA discussing the results of the IPM modeling of changes in the generation mix.

October 27, 2010

- Coal Retirement Effects on Reliability EPA CEQ Meeting 1.pptx - This is a presentation that was gone through during the meeting to give a brief

background on the work being done at FERC. **This contains maps of at-risk units and OER retirement estimates.**

- Comparison of EPA and OER.xls - This chart contains charts showing the scores assigned by the OER assessment to the plants under consideration in the EPA's model. **The chart contains all modeling data from the OER's assessment of coal generation and the EPA's output.**
- EPA Model Data – Parsedfile_TR SB Limited Trading 2014.xls - This is the output from the EPA's IPM program based on inputs for the Transport rule. This contains only the "policy case" output.
- Coal Retirement Reports DEA.xls - This is a comparison of the levels of capacity that are predicted to retire under currently released studies. It includes estimates from both FERC and the EPA as well. **This contains NERC and OER reserve margin and capacity estimates.**
- NERC and OER Reserve Margin Comparison.xls - This contains charts of the impact the retirement of at-risk capacity as estimated by both OER and NERC would have on regional reserve margins. **This contains NERC and OER reserve margin and capacity estimates.**
- Planned Capacity Projects.xls - These charts show planned capacity additions by year overlaid with OER retirement estimates. **This contains estimated at-risk capacity from the OER assessment.**
- Retirement and Construction Data.xls - These charts show both planned capacity and planned retirements by year. **It also contains estimated at-risk capacity that could be retired from the OER assessment.**

February 16, 2011

- FERC Potential Assistance if required.docx - This is a file that was received from the EPA detailing ways in which FERC staff could assist the EPA CAD in their analysis including reviewing retirement estimates and modeling, regional resource adequacy, transmission congestion, voltage issues, frequency response issues and impacts to black start units.
- FERC-DOE_Review.docx - This file lists EPA CAD's suggested ways in which DOE and in particular FERC could assist the EPA CAD staff with analysis efforts which would include reviewing retirement estimates and modeling, regional resource adequacy, transmission congestion, voltage issues, frequency response issues and impacts to black start units.
- ParsedFile_BC_24.xlsx - This is the output from the EPA CAD's IPM program based on inputs for the Transport rule and the Toxics rule. This contains only the "policy case" output.
- ParsedFileDescription.docx - This contains details and information on each of the columns and data types included in the "policy case" output.
- Resource Adequacy and Reliability_v3.docx - This report details the EPA CAD's analysis regarding potential impacts to reliability due to the retirement of capacity predicted by IPM.

- Toxics and TR Closures-134 CAMD Units Heat Inputs-Feb 15 2011.xlsx - This contains unit specific data on those units considered to be at-risk in the EPA's model.

April 4, 2011

- Base Case.xls - This is the output of the "base case" of the EPA CAD's modeling efforts.
- Policy Case.xls - This is the output of the "policy case" of the EPA CAD's modeling efforts.

April 4, 2011 Carlson

- EPA RMR Gen Retire Inquiry(3) - Memo detailing FERC Reliability Must Run policies and key orders that explain those policies.

Files prepared for initial staff assessment

- OER Screening Tool.xls- This contains a tool by which FERC was able to make an initial estimate of what the potential impacts of upcoming EPA regulations may be.
- Coal Retirement Effects on Reliability Final.pptx- This was a presentation prepared regarding FERC's initial analysis of the potential impacts of the upcoming EPA regulations.

Additional spreadsheets and charts

- EPA Analysis.xls- This contains charts and an analysis of the output from the EPA's IPM modeling efforts for the Toxics Rule.
- Maps for at Risk Units.doc- This contains maps of several regions with units designated as at-risk for retirement by the Screening Tool developed by FERC.
- PROMOD Results.xls- This contains the analysis of a PROMOD study done of the potential impact of the upcoming EPA regulations and capacity retirements in PJM.
- Regional Data on Coal Retirement and NERC Report Comparison.xls- This file contains charts and analysis comparing estimates from initial FERC analysis with the results of NERC's study of the impact of the upcoming EPA regulations.
- Review of EPA Data.doc- This file contains analysis of the output from the EPA's IPM modeling efforts for the Toxics Rule.
- Slides Using New Data.ppt – This contains updated slides for the presentation on the potential impacts of the upcoming EPA regulations.
- Upcoming and Retiring.doc- This file contains charts comparing the amount of capacity expected to be retired and constructed in each NERC region through 2020.

Summaries

- April 27 Meeting.doc- This file contains a summary of the meeting attended by FERC and EPA staff on April 27th.
- Comparison and Summary of ParsedFile.doc- This file summarizes the results from the initial IPM run completed by the EPA and shared with FERC on October 27th.
- February 16 Meeting.doc- This file contains a summary of the meeting attended by FERC and EPA staff on February 16th.
- Meeting to Review Coal Retirements and EPA Regulations.doc- This file contains a summary of the meeting attended by FERC and EPA staff on October 27th.
- New Air Pollution Transport Rule.doc- This contains a summary of the new information released by the EPA regarding the Clean Air Transport Rule.
- November 4 Meeting.doc- This file contains a summary of the meeting attended by FERC and EPA staff on November 4th.

Outside reports and summaries

- Bernstein Coal Ash Report Summary.doc- This file contains a summary of the *Bernstein Report on EPA Proposal for Coal Ash Regulation* completed on May 5th.
- Citi 2010 Overview of Major Upcoming EPA Environmental Policies 012710.pdf – This is a study completed by Citi regarding the impact of EPA regulations on coal generation.
- Citi Power, Gas, Coal & Alt Energy Conference 060810.pdf - This is an updated analysis completed by Citi regarding the impact of EPA regulations on coal generation.
- Citi Proposed Coal Ash Rules Look Light; Dirty Power Positive 050510.pdf - This is an updated analysis completed by Citi regarding the impact of EPA regulation of coal ash on coal generation.
- CS Report Analysis 2.doc- This file address questions raised by the Credit Suisse report released in September 2010.
- Exelon CRA Report.pdf – This is a study completed by CRA regarding the impact of EPA regulations on coal generation.
- MJBAandAnalysisGroupReliabilityReportAugust2010.pdf – This is a study completed by MJ Bradley regarding the impact of EPA regulations on coal generation.
- NREL Report v2.doc- This summarizes the *Presentation Analyzing Potential Impacts of Coal Plant Retirements in the U.S.* that was completed on October 6th.
- Press Release for MJBA and Analysis Group Reliability Report August 2010.pdf – This the press release related to the MJ Bradley study of the upcoming EPA regulations.
- Summary of INGAA Report on Renewable Integration.doc- This summarizes the INGAA Report *Firming Renewable Electric Power*

Generators: Opportunities and Challenges for Natural Gas Pipelines that was released on March 21, 2011.

- Summary of NERC Climate Change Part 2.doc – This answers questions raised by NERC’s report on climate change regulations.
- Summary of NERC Reliability Assessment of EPA Regulations FINAL ver1.doc- This summarizes the *2010 Special Reliability Scenario Assessment: Potential Resource Adequacy Impacts of U.S. Environmental Regulations October 2010 Report*.
- Summary of NERC Reliability Impacts of Climate Change Initiatives.doc- This summarizes the *NERC Reliability Impacts of Climate Change Initiatives* that was completed on July 28, 2011.
- Summary of Report by CRA on Coal Retirements (3).doc- This summarizes *A Reliability Assessment of EPA’s Proposed Transport Rule and Forthcoming Utility MACT* by Charles River Associates that was completed on December 20, 2010.
- Summary of Report Prepared for Clean Energy Group final.doc- This summarizes *Ensuring a Clean, Modern Electric Generating Fleet While Maintaining Electric System Reliability* by M.J. Bradley & Associates.
- Summary of the December 8th Coal Retirement Presentation by the Brattle Group.doc- This summarizes the December 8th presentation by the Brattle Group regarding the potential impact of upcoming EPA regulations.
- Updated Summary of NERC Reliability Assessment of EPA Regulations.doc- This summarizes the *2010 Special Reliability Scenario Assessment: Potential Resource Adequacy Impacts of U.S. Environmental Regulations 9/2/2010 Draft*.
- EEI_PeerReview_Tierney_Cicchetti_May2011.pdf – This is an analysis of EEI’s study of the impact of the EPA’s regulation on coal generation.
- BPC report on EPA regs.pdf – This is an analysis by BPC of the economic impacts of the EPA’s regulations on coal generation.
- Summary of the Environmental Regulation and Electric System Reliability Report by the Bipartisan Policy Center.doc - This summarizes the *Environmental Regulation and Electric System Reliability Report* by the Bipartisan Policy Center.

OMB Data

February 15, 2011

- *Toxics_Rule_OMB_021611.ppt* – This is a briefing provided by the EPA regarding its upcoming regulations affecting power plants.

February 24, 2011

- *Resource Adequacy and Reliability for Toxics Rule 02-24-11.pdf*- This file contains analysis of IPM’s predictions regarding the impact of the Toxics Rule on resource adequacy and reliability.

February 28, 2011

- 2_28_2011DRAFT - Toxics Rule Direct Emp Analysis TSD_Draft.pdf- This file contains a draft of the analysis regarding the Toxic Rule's impact on jobs.
- 2_28_2011EO12866_CoolingWaterIntakes 2040-AE95 Draft Market Model Results 20110225.doc- This file contains a summary of the Market Model Analysis completed for 316(b).

March 4, 2011

- Resource Adequacy and Reliability_v4.doc- This file contains analysis of IPM's predictions regarding the impact of the Toxics Rule on resource adequacy and reliability.
- Projected Retirements.doc- This contains a list of the units excluded from the IPM modeling efforts as they are already planning to retire in addition to those units the model projects will retire in both the base and policy cases.

March 8, 2011

- Interagency Working Comments under EO 12866 on EGU MACT Underlying Science- This includes a summary of comments provided on the EPA's MACT regulations RIA Chapter 5.

March 9, 2011

- 3_9_11_ToXR_Base_Case.epa.zip- This file contains output for the base case from the IPM analysis of the Toxics Rule's impacts.
- 3_9_11_ToXR_Policy_Case.epa.zip- This file contains output for the policy case from the IPM analysis of the Toxics Rule's impacts.

March 11, 2011

- Toxics Rule Resource Adequacy and Reliability 03-09-11_final.docx - This file contains analysis of IPM's predictions regarding the impact of the Toxics Rule on resource adequacy and reliability.
- Chapter 4.pdf – This contains technical information supporting conclusions made in the EPA's regulation of power plants.

March 14, 2011

- Summary of Interagency Working Comments on draft EGU MACT under EO 12866 Interagency Review_03 04 _Response_031411.doc- This is a summary of comments on EGU MACT Preamble, RIA, the October 2002 EPA Study, and the TSD titled "RESOURCE ADEQUACY AND RELIABILITY IN THE IPM PROJECTIONS FOR THE TOXICS RULE."

- Summary of Interagency Working Comments on draft EGU MACT under EO 12866 Interagency Review_03 04 _Response_031411.doc- This is a summary of comments on comments on the MACT Floor and supporting spreadsheets, IPM documentation, feasibility study, and the planned/expected retirements.