OTTER TAIL POWER COMPANY
Docket No: EL14-082

Response to: South Dakota Public Utilities Commission
Analyst: SDPUC Staff
Date Received: 10/03/2014
Date Due: 10/17/2014
Date of Response: 10/14/2014
Responding Witness: Peter J. Beithon, Manager, Regulatory Recovery - (218) 739-8607

Information Request:

We understand that the decision to install the environmental retrofits were based on South Dakota's State Implementation Plan for Big Stone and EPA MATS compliance for Hoot Lake and many years prior to EPA's proposed 111 (d) rule. We also recognize that there is uncertainty surrounding EPA's 111 (d) rule but would like understand the following from an educational perspective:

a. If EPA's proposed 111 (d) is implemented as proposed, what would be the implications for Big Stone and Hoot Lake?

b. Please explain if the retrofits that are being implemented would still be cost effective.

c. Also, please explain if Otter Tail conducted any sensitivity analysis regarding potential GHG emission reductions compliance at the time it made its decisions regarding the two plants and provide the results/relevant workpapers.

Attachments: 2

Attachment A to IR SD-PUC-02-02 Stategist Modeling Runs.pdf
Attachment B to IR SD-PUC-02-02 Burns McDonnell Big Stone Modeling Results.pdf

Response:

a. On June 18, 2014, EPA published the proposed Clean Power Plan (CPP) under Section 111(d) of the Clean Air Act. The CPP proposes state-specific rate-based goals for carbon dioxide emissions from the power sector, as well as guidelines for states to follow in developing plans to achieve the goals. As proposed, an interim goal would need to be achieved on average over the ten year period of 2020 - 2029, and a final goal would need to be achieved in Year 2030 and each year thereafter. EPA uses a formula that relies on four building blocks to determine the state-specific goal: (1) a six percent heat rate improvement at each coal plant, (2) increased reliance on natural gas combined cycle units, (3) a renewable energy target, and (4) demand side energy efficiency savings. EPA's formula creates substantially different percent reduction targets for each state, primarily due to EPA's second building block that envisions re-dispatching natural gas combined cycle units to a 70% capacity factor. OTP is developing comments on the

proposal and is actively involved with numerous stakeholders to discuss the implications of the rule. Comments are due by December 1, 2014.

Specific to Big Stone Plant, as described by Otter Tail personnel at the July 31st South Dakota PUC 111(d) Forum in Sioux Falls, the 111(d) rule as proposed for South Dakota is infeasible.[1] Building block 1 is unachievable at Big Stone Plant since the plant has already performed – or is in the process of performing – the heat rate improvement projects identified by EPA. Furthermore, the owners of the Big Stone Plant are investing $384 million to install pollution control equipment in 2015 to comply with EPA's Regional Haze Rule. This equipment will take a significant amount of power to operate, and therefore net plant heat rate may degrade because it may take the same amount of fuel to produce a lesser amount of net plant output. Building block 2 is more concerning, because rigidly applying that building block to Big Stone Plant would result in severely restricting operation to approximately half the year. Otter Tail has been discussing the flawed methodology of applying building block 2 in South Dakota with numerous stakeholders, including EPA. Building block 2 is flawed because it envisions re-dispatching a significant amount of energy between Big Stone Plant and Deer Creek Station – which is owned by Basin Electric Power Cooperative. This re-dispatch is not possible within the current industry and regulatory constructs because Big Stone and Deer Creek are separately owned, serve unique loads, there are no firm transmission rights from Deer Creek to the loads served by Big Stone, and they are committed and dispatched by two separate entities with unique commitment and dispatch processes.

Notwithstanding the infeasibility of building block 2 in South Dakota, this block was further skewed due to Deer Creek Station being under construction for most of 2012 (EPA's baseline year for determining plant capacity factor), resulting in an unrepresentative 1% capacity factor. Block 2 wrongly assumes that Deer Creek's capacity can be increased by 69%, and backing down Big Stone Plant the corresponding amount. Otter Tail is strongly advocating that combined cycle plants that were not operational on January 1, 2012 - such as Deer Creek - are assigned an "under construction" designation in EPA's Clean Power Plan formula. This designation would apply an assumed 55% capacity factor to Deer Creek Station that is more representative of the expected operation of new natural gas combined cycle power plants.

Specific to Hoot Lake Plant, since the plant is planned to be retired in the 2020 timeframe, it is highly unlikely that there will be any implications of applying the 111(d) rule to the plant.

b. Otter Tail's analysis indicates that the installation of pollution control equipment at Big Stone Plant in 2015 to comply with EPA's Regional Haze Rule is cost effective even in light of the proposed 111(d) rule.

Otter Tail performed an analysis using Otter Tail's resource planning modeling software. The analysis compared the present value of revenue requirements (PVRR) of two

[1] Otter Tail's presentations can be found on the South Dakota PUC's website at http://puc.sd.gov/pucevents/EPAforum/default.aspx

scenarios related to Big Stone Plant. *Scenario 1* assumes that Big Stone Plant continues operation until the end of 2024, which is the mid-point of the interim goal period in the proposed 111(d) rule. *Scenario 1* assumes that Big Stone Plant is replaced with a natural gas combined cycle plant that would begin operation in 2025.
Scenario 2 assumes that Big Stone Plant continues operation until the end of May 2017, the date that Big Stone Plant would need to discontinue operations without complying with EPA's Regional Haze Rule. Scenario 2 assumes that Big Stone Plant is replaced with a natural gas combined cycle plant that would begin operation in June 2017.

The PVRR of *Scenario 2* was over $150 million more than scenario 1, clearly indicating that the installation of pollution control equipment at Big Stone Plant in 2015 to comply with EPA's Regional Haze Rule is cost effective even in light of the proposed 111(d) rule.

c. For Hoot Lake Plant, Otter Tail did not conduct analysis of GHG emissions reductions compliance as part of the Baseload Diversification Study (MN Docket E017/RP-10-623). However, as part of the study, Otter Tail evaluated differing levels of externality costs associated with emissions (emissions tax). The study indicated that operating Hoot Lake Plant through 2020 was preferred compared to an early retirement of 2015 or an extended life through 2040 under varied emissions tax sensitivities. (See Attachment A. Compare Sensitivities 1, 14, 15, 16, 17)

For Big Stone Plant, as a part of its Advanced Determination of Prudence proceedings, Otter Tail performed a similar evaluation of varying levels of emissions taxes. No analysis of GHG emission reductions was evaluated. Our analysis showed that even at the highest level of emissions taxes, it was still a lower cost than retiring the plant and replacing it with natural gas generation. (See Attachment B, Figure 4)