

PSEG Nuclear, LLC
ZEC Application – Salem 1
Docket No:

Response to Application Request: SI-SSA-0024
Date: 12/19/2018

Question:

Results from internal or commissioned dispatch modeling of the impact of the Unit's retirement scenarios.

- Include all assessments of avoided emissions, based on differential (with and without each Unit claimed for ZECs) scenario modeling
- Include all work papers and modeling inputs and outputs
- If no such modeling has been conducted, include an explanation and computation of avoided emissions from retention of the Unit.

Attachments Provided Herewith: Yes

Response:

Please find attached results from the commissioned dispatch modeling of the impact of the Unit's retirement scenarios performed by PA Consulting.

This independent Report by PA Consulting demonstrates that power sector emissions would materially increase in the near future if the Hope Creek, Salem 1, and/or Salem 2 nuclear generators were to retire, which could have serious human and environmental health impacts.

If one of three nuclear generators (Hope Creek was selected as a proxy) were to retire, CO₂ emissions from New Jersey generators alone would increase by nearly 1.9 million tons from June 2019 through May 2022. For context, this CO₂ emission impact is roughly equivalent to having over 120,000 additional passenger vehicles per year driving in New Jersey over the same timeframe. If Hope Creek, Salem 1, and Salem 2 were all to retire, CO₂ emissions from New Jersey generators would increase by over 6.4 million tons over the same timeframe, roughly equivalent to having over 420,000 additional passenger vehicles per year driving in New Jersey. However, power sector emissions would also increase outside of New Jersey, if these nuclear generators were to retire. Because CO₂ is a global pollutant, CO₂ emission changes over these broader geographic footprints that stem from the retirement of Hope Creek, Salem 1, and/or Salem 2 would directly impact New Jersey. If Hope Creek were to retire, CO₂ emissions from generators across the RGGI footprint would increase by nearly 4.6 million tons from June 2019 through May 2022, roughly equivalent to adding over 300,000 passenger vehicles per year over the same timeframe. Across the entire Eastern Interconnect, CO₂ emissions from generators would increase by nearly 13.0 million tons, roughly equivalent to adding over 850,000 passenger vehicles per year. If Hope Creek, Salem 1, and Salem 2 were to retire, CO₂ emissions from

generators across the RGGI footprint would increase by nearly 12.9 million tons from June 2019 through May 2022, roughly equivalent to adding nearly 850,000 passenger vehicles per year over the same timeframe. Across the entire Eastern Interconnect, CO₂ emissions from generators would increase by over 24.9 million tons, roughly equivalent to adding over 1.6 million passenger vehicles per year.

Power sector emissions of more localized pollutants would also increase if these nuclear generators were to retire. If one out of three generators were to retire (Hope Creek was selected as proxy), emissions of NO_x and SO₂ in the MAAC Region would each increase by over 4 million tons from June 2019 through May 2022. If all three nuclear generators were to retire, emissions of NO_x and SO₂ in the MAAC Region would each increase by over 11 million tons over the same timeframe. Similarly, if Hope Creek were to retire, Hg emissions in the MAAC Region would increase by over 14 lbs while PM₁₀ and PM_{2.5} emissions would increase by approximately 1,100 tons and 1,000 tons, respectively. If all three nuclear generators were to retire, emissions of Hg would increase by over 26 lbs while PM₁₀ and PM_{2.5} emissions would each increase by over 2,200 tons.

Moreover, PA Consulting's analysis indicates that the retirement of these nuclear generation units would lead to significant fuel diversity consequences in the greater New Jersey region, increasing MAAC dependence on natural gas and coal and driving up costs for those fuels during peak winter demand events. Specifically, if one of three nuclear generators were to retire (Hope Creek was selected as a proxy), coal- and natural gas-fired generation would increase by 2.8% across the MAAC region, and 1.7% on the Peak Winter Day. The combined coal and natural gas share of MAAC-wide generation would climb from 62.9% (the Base Case assumption) to 65.3%. Natural gas prices across TM3, TZ6 NY, and TZ6 non-NY would also be higher on a weather normalized Peak Winter Day. If Hope Creek, Salem 1, and Salem 2 were to retire, coal- and natural gas-fired generation would increase by 8.8% across the MAAC region, and 9.6% on the Peak Winter Day. The combined coal and natural gas share of MAAC-wide generation would climb to 70.3%. Natural gas prices across TM3, TZ6 NY, and TZ6 non-NY would also be higher on a weather normalized Peak Winter Day. These dynamics threaten both grid reliability as well as delivering energy at reasonable costs to consumers.

Finally, the retirement of one unit only (Hope Creek was selected as a proxy) would significantly reduce nuclear generation within the State. This lost nuclear generation is replaced almost entirely by electricity imports (primarily natural gas- and coal-fired) from elsewhere in PJM and neighboring electricity regions, as well as increased natural gas-fired generation within New Jersey. Natural gas-fired generation comprises approximately two-thirds of aggregate Study Period generation in New Jersey under the Hope Creek Retirement Case.

In addition to the PA Consulting report discussed above, four other reports relevant to the response to Question VII-SSA-024 are (a) Brattle report of November 2017 entitled "Salem and Hope Creek Nuclear Power Plants' Contribution to the New Jersey Economy", (b) IHS Markit report of November 2017 entitled "The Value to New Jersey Consumers of Salem and Hope Creek Nuclear Power Generation in Providing Reliable, Resilient, Affordable, and Environmentally Responsible Electricity", (c) ERM report of November 2018 entitled "Impacts of PSEG Nuclear Unit Shutdowns on New Jersey's Global Warming Response Act Limits", and

(d) ERM report of November 2018 entitled “Impacts of PSEG Nuclear Unit Shutdowns on New Jersey’s Ozone Attainment Goals”. These reports are included in our response to Question VII-SSA-021.