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**STATE OF NEW JERSEY
BOARD OF PUBLIC UTILITIES**

In the Matter of the Application of PSEG Nuclear, LLC and Exelon Generation Company, LLC For the Zero Emission Certificate Program - Salem Unit 1

Docket No. ER20080557

In the Matter of the Application of PSEG Nuclear, LLC and Exelon Generation Company, LLC For The Zero Emission Certificate Program - Salem Unit 2

Docket No. ER20080558

In the Matter of the Application of PSEG Nuclear, LLC For The Zero Emission Certificate Program – Hope Creek

Docket No. ER20080559

**CROSS EXAMINATION QUESTIONS ON DIRECT TESTIMONY OF CARL FRICKER
ON BEHALF OF THE PJM POWER PROVIDERS GROUP (P3)**

Question No. 1

Please refer to the Direct Testimony of Carl Fricker at page 2 of 18, lines 15-23: Would you agree that all power plants, fossil and renewable, face similar risk with policy changes such as the Mercury and Air Toxics Standards (MATS), Clean Power Plan, and RGGI? If not, why not?

Question No. 2

Please refer to the Direct Testimony of Carl Fricker at page 2 of 18, lines 15-23: Would you agree that some of those risks to fossil and renewables are positive upside regulatory risks to nuclear as it increases competitors’ capital or running costs and lead to retirements that helps lead to higher prices in energy and capacity markets? If not, why not?

Question No. 3

Please refer to the Direct Testimony of Carl Fricker at page 3 of 18, lines 1-4: Would you agree that equipment failures can be mitigated by proper maintenance practices? If not, why not? Are you saying PSEG is not engaging in prudent maintenance practices to minimize such failures? If not, why is this such a large risk?

Question No. 4

Please refer to the Direct Testimony of Carl Fricker at page 3-4 of 18, starting at line 11 on page 3: These examples are historic. What known issues are pending at the NRC that would raise costs? According to NEI data, these costs gone down or were one-time costs since these events occurred. Do Salem and Hope Creek follow these industry trends of lower costs? If not, why not?

- a. Regarding Fukushima related costs, are these still recurring? What was the cost impact on a \$/MWh basis over the entire 2012-2018 period? Were these costs mostly capital investments or O&M expenses? What are these future risks? Are there any rulemakings at NRC that would increase costs?
- b. Regarding September 11, 2001 costs, are these cumulative since 9/11 or an annual charge of \$140 million? If cumulative, please break this down into \$/MWh for these costs incurred. What are these \$/MWh costs on an annual basis?
- c. Regarding Generic Safety issues, are these O&M or capital expenses? Please place this \$26 million value in \$/MWh terms for 2006 and 2007.
- d. What are these future regulatory risks? Are there any rulemakings at NRC that would increase costs? What are these future anticipated costs?

Question No. 5

Please refer to the Direct Testimony of Carl Fricker at page 5 of 18, lines 1-13. Is this a result of poor maintenance practice to reduce costs? Or was it a poor engineering design that is now solved? Or is it just age and time for replacement?

Question No. 6

Please refer to the Direct Testimony of Carl Fricker at page 5, lines 14-19. Were the steam turbine replacements capital expenses? What is the cost of the \$266 million on a per MWh over 6 years? Did these replacements result in uprates to increase output? If so, how much was the uprate? If this was capital costs, are these costs now recovered and paid off?

Question No. 7

Please refer to the Direct Testimony of Carl Fricker at page 5 of 18 starting at line 20 through page 7 of 18 ending at line 3: Are these a result of poor maintenance practice to save money? Or just

age and need for replacement at the end of life? Are maintenance and equipment discoveries better during refueling outages to minimize the outage length? Would these have been discovered absent refueling outage inspections? What are the \$/MWh cost impacts of the repairs?

Question No. 8

Please refer to the Direct Testimony of Carl Fricker at page 7 of 18 starting at line 4 through page 8 line 2: Has PSEG ever had such catastrophic failures such as these mentioned here? Are you suggesting PSEG has the same safety and maintenance problem these resources have? Are you suggesting PSEG is hiding such potential catastrophic failures that have not been reported to NRC or the SEC?

Question No. 9

Please refer to the Direct Testimony of Carl Fricker at page 9 of 18, lines 1-14: Are you suggesting PSEG does not have insurance against such events such as a hurricane? If not, why not? If so, isn't this risk borne by the insurance company to which PSEG pays the premiums? Did PSEG receive any insurance payouts for damages from Hurricane Sandy in 2012? If there is insurance, does it not cover lost energy revenues as well? Why or why not?

Question No. 10

Please refer to the Direct Testimony of Carl Fricker at page 9 of 18, starting at line 15 to page 10 of 18, line 13: Why is the \$/MWh risk separate from maintenance and equipment risk? Can this not be mitigated through prudent maintenance practices? Why or why not?

Question No. 11

Please refer to the Direct Testimony of Carl Fricker at page 10 of 18, line 14, to page 11 of 18, line 2: Would PSEG still need to pay the cost of security details? What about losses related to unrecovered capital costs?

Question No. 12

Please refer to the Direct Testimony of Carl Fricker at Section III Environmental Benefits: Have you ever worked with airshed models to assess pollution transport? Have you or your staff studied pollution transport? Do you have any experience with power system economic dispatch and system operation that would allow you to accurately determine what resources would replace any retired nuclear units? If so, please provide that experience as shown in your resume/CV. If not, how are you qualified to state the conclusion you have made in this section?

Question No. 13

Please refer to the Direct Testimony of Carl Fricker at page 11 of 18 to page 12 of 18, line 5: What is the source of your conclusion regarding change in dispatch after Oyster Creek retired? Have

you looked at the actual dispatch of resources without Oyster Creek to draw your conclusion? Does your conclusion rely on the marginal or average emissions rates posted by PJM?

Question No. 14

Please refer to the Direct Testimony of Carl Fricker at page 14 of 18, lines 5-8: Do you have experience with environmental justice issues? Can the impacts be due to transportation and not power? How do you know how to draw the distinction between power generation and transportation?

Question No. 15

Please refer to the Direct Testimony of Carl Fricker at page 16 of 18 lines 5-14: Define fuel diversity. Do you have data that shows that nuclear provides greater fuel diversity? Do you know the mix in PJM today? Compare the generation mix today to 5, 10, and 15 years ago? Would you say this appears more diverse?

Question No. 16

Please refer to the Direct Testimony of Carl Fricker at page 17, Figure A: Please state MWh generated by New Jersey resources pre-retirement and post retirement in the figure. Are total gas-fired MWh in New Jersey increasing, if so how much is re-dispatch and how much is due to new resources coming into service? Provide change in MWh of out of state generation by fuel source.

Question No. 17

Please confirm whether the nuclear unit capacity factors in the next ZEC period as assumed by PSEG are higher or lower than historic capacity factors from the past 10 years.

Question No. 18

Please confirm that the PSEG Board statements and 2019 10-K cited do not mention a level of ZEC prices needed to remain in commercial operation and that these statements do not indicate that without the \$10/MWh payment, the resources will shut down.

Question No. 19

Please indicate if the going forward costs of nuclear units as reported by the PJM Independent Market Monitor are within +/-5% of the PSEG reported historically incurred costs. Are these costs above or below the values used by the PJM Independent Market Monitor? Are these costs above or below the values used by ICF in the Integrated Planning Model?