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PSEG Services Corporation

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Via Public Document Search & Electronic Mail
Sherri L. Golden
Secretary of the Board
New Jersey Board of Public Utilities
44 South Clinton Avenue, 1st Floor
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Board.Secretary@bpu.nj.gov

Re: In the Matter of New Jersey's Distributed Energy Resource Participation in Regional Wholesale Electricity Markets
Docket No. EO24020116

Dear Secretary Golden:

Pursuant to the New Jersey Board of Public Utilities ("BPU") Staff Request for Information issued on March 7, 2024 in the above-captioned docket, Public Service Electric and Gas ("PSE&G" or "Company") provides the following responses set forth below. PSE&G supports the overarching goals of implementing FERC Order No. 2222 in a transparent, efficient and cost-effective manner that concurrently enables continued safety and reliability of the transmission and distribution system.

Questions for New Jersey Electric Distribution Companies

1. How is your EDC preparing for the operation of DERAs ("Distributed Energy Resources Aggregations") within the distribution grid? Please explain any processes already under development and which departments (e.g., Operations, Finance, System Planning) are doing this preparation work.

PSE&G has and will continue to make the necessary strategic investments to modernize the grid while maintaining its focus on providing safe, reliable, and affordable service to its customers. These investment decisions have and will continue to grow in complexity as utilities integrate higher levels of Distributed Energy Resources ("DER"), storage and electric vehicles onto their systems. Specifically regarding DERA's, PSE&G has actively engaged in PJM stakeholder meetings with other EDC's to identify risks, challenges and opportunities with respect to FERC Order No. 2222. Because DERA and the associated processes remain largely undefined, PSE&G has not independently developed new processes specifically with respect to DERA.

As the BPU considers the implementation of FERC Order No. 2222, PSE&G recommends consideration of the following overarching factors in the policy discussions to enhance grid modernization and utility distribution planning efforts:

- Comprehensive Integrated distribution planning, which will identify utilities' resource needs, policy goals, and operational constraints across New Jersey's dual energy systems and plan and respond to customers' needs, is vital.

- Improvements to regional load forecasting, which will allow utilities to respond to customers' demands and state decarbonization policies. Transmission projects require PJM and load serving entities to forecast the load over a ten (10) to fifteen (15) year horizon and alignment on that forecast is critical for success. In addition to transmission planning, regional load forecast plays a critical role in determining how much generation needs to be built and where.

- State regulatory frameworks (including rate mechanisms, cost recovery) that guide how the investments will be made will be key in assuring customer affordability and determining how accelerated reinforcement/upgrades to the electric system and new load such as DERs, Electric Vehicles ("EVs"), and other anticipated large loads should be measured.

PSE&G is committed to working collaboratively with BPU and other regulators to support this transformation. PSE&G advocates for continued discussions on what current and future investments are necessary and will support and further both hardening and resiliency goals, all while addressing evolving state policies.

2. Are there any concerns about DERAs' impacts on grid reliability that your EDC believes have not been adequately addressed by PJM or the NJBPU, to this date? Has your company quantified these impacts through risk assessments such as the System Average Interruption Duration Index ("SAIDI") or the System Average Interruption Frequency Index ("SAIFI")?

Response: PSE&G anticipates both distribution and transmission grid impacts due to large scale DER penetration. One specific concern is voltage control on the distribution circuit. Per N.J.A.C. requirements and tariff obligations, PSE&G is required to maintain customer voltages at +/-5% of nominal voltage. It is unclear how the interaction of large-scale DER/Photovoltaic systems ("PV") will interact with existing utility voltage regulation equipment. The Company expects voltage and power quality issues with large scale DER penetration. Additionally, large scale DERA could potentially affect outage restoration efforts. Currently, PSE&G lineworkers are trained to work on "live" distribution circuits to make repairs and restore customers. This practice has a significant positive impact to customers and on reliability metrics. Due to the incremental arc flash energy contributions from DER due to increased short circuit currents and the time delay of the inverter isolation, it is unknown whether PSE&G will be able to continue to perform "live" line work due to increased safety concerns. If the "live" line work practice were to be abandoned, there likely would be a major negative impact on customer reliability metrics.

a. Are there any suggested solutions to these concerns that your EDC recommends?

Have cost and benefit calculations been run on these proposed solutions?

Response: PSE&G suggests the commissioning of comprehensive dynamic studies to better understand the voltage regulation/power quality concerns. In anticipation of these concerns, PSE&G has begun a program to install new "smart" capacitor banks. However, the problems must be better understood to determine a full set of solutions. PSE&G also suggests commissioning studies to better understand the impacts of DER on the ability to safely perform live line work. PSE&G has a large distribution system and a large workforce in place to ensure safe and reliable power is delivered to customers. It is important to proactively anticipate and address these concerns. There have been no cost benefit analysis completed for these suggestions.

b. Have probabilities of occurrence been considered and factored into the risk assessments?

Response: There have been no quantified risk assessments completed.

3. Does your EDC have procedures in place to account for and support the addition of new DER technologies into DERAs that may develop between Order No. 2222's implementation and the earliest market participation by DERAs?

Response: Currently there are no procedures in place since no approved regulations or requirements have been published through PJM. Once these are defined, PSE&G will establish procedures in compliance with these rules.

a. Are there any technological, cyber security, or software updates that are needed prior to implementation?

Response: There are potentially significant upgrades in technology, cybersecurity, and software to integrate DERs into the wholesale electricity market efficiently and securely. Some examples could be upgrades to systems for dynamic monitoring and control of inverter-based solar systems, unique regulatory reporting requirements for FERC Order No. 2222 compliance and market participation platforms. The scope and scale of these changes will be dependent on the regulations and utility roles defined.

b. Are there any retroactive impacts requiring modification to existing interconnection agreements?

Response: A DER's transition into DERA participation with wholesale markets will require termination of any existing interconnection agreements associated with a state retail program such as net electric metering and the execution of a new interconnection agreement compatible with DERA regulations.

4. Are there any costs for facilitating the DER aggregation process that your EDC expects it needs to pay as part of Order No. 2222 implementation work such as software updates and administrative support? Would these costs be for operational process technologies or additional business functions? Do you have an estimated level of costs available at this time? If not, what is your company's schedule for developing these cost estimates?

a. What is your envisioned mechanism for cost recovery?

Response: Additional costs are dependent on how Order No. 2222 is implemented by PJM. PJM's compliance filing was accepted by FERC in March 2024. We expect PJM will work with stakeholders to develop processes for the implementation of Order No. 2222. The details of how Order No. 2222 is implemented will determine the scope and magnitude.

5. Have you evaluated how combining current and planned generation projects will fit into existing projects and plans, and where limitations may exist?

Response: PSE&G evaluates the generation Interconnection requests to assess the reliability impact on system infrastructure. As an Electric Distribution Company (EDC), PSE&G does not develop generation, instead relies upon interconnection requests through the PJM process for the wholesale markets, as governed by PJM Manual 14H: New Service Requests Cycle Process (https://www.pjm.com/-/media/documents/manuals/m14h.ashx).

6. How will your EDC ensure that provisions in PJM's rules pertaining to the double compensation risk for net energy metered DERs are enforced for resources within your company's service territory that will also participate in the wholesale energy markets?

Response: PSE&G contends that the wording of PJM's "double counting" or "double compensation" provision goes beyond the permitted scope of FERC Order No. 2222 and has requested clarification of this issue.

7. Please detail, if applicable, how your telemetry, metering and settlement requirements differ from PJM's.

   a. Does your EDC have comments on the advanced metering infrastructure (AMI) data interval requirements as it relates to the requirements for authorized communication networks in the wholesale market?
   b. Specifically, how would any modifications be implemented to interval metering devices to bring them into compliance for DERA operation?

Response: PJM has issued limited details regarding settlement and metering details which will be required for FERC Order 2222. It is our understanding that PJM plans on updating the manuals in the future with further details. At this time, it is expected that existing settlements (and other) systems would need to be modified to accommodate FERC Order No. 2222 requirements. However, the exact nature of the updates for these systems will depend on the final requirements set-forth in the in the to-be-published PJM manuals.

8. Please specify any unique needs or concerns your EDC has in regard to PJM's demand response opt-out provisions. Are there existing limitations that may restrict demand response from joining a DERA within your service territory?

Response: PSE&G has not identified any concerns with PJM's proposed demand response opt-out provisions, and we are not aware of existing limitations that may restrict demand response resource from joining a DERA within its service territory.

9. Are there any aspects of the cybersecurity standards that govern DERAs that your EDC has questions or concerns about? How does your EDC intend to enforce cybersecurity for DERAs that fall within your service territory?

Response: Currently there are no published cybersecurity standards that are unique to DERA's. PSE&G has cybersecurity standards and procedures that comply with national, industry and other standards, such as those set by the North American Electric Reliability Corporation (NERC) and the National Institute of Standards and Technology (NIST). PSE&G would intend on utilizing its current standards and make any adjustments necessary as the DERA rules are defined.

a. Please clarify any details on who in your organization will be responsible for coordinating DERA cybersecurity issues and what procedures you will enact to enforce cybersecurity processes among DER components?

Response: PSE&G has a Cyber Security Risk & Compliance organization that defines cybersecurity requirements for PSE&G. Technical experts in Asset Management and Information Technology ensure current equipment and technical standards are compliant and project and support teams ensure implementation of these standards as part of a project or maintenance work.

10. With New Jersey adopting the Institute of Electrical and Electronics Engineers (IEEE) Standard 1547, specifically 1547-2018, to govern the interconnection and interoperability between inverter based DERs and utility electric power systems, do you anticipate any difficulty in managing aggregations and the individual DER Components that are interconnected? Are there processes or limitations existing today on a DERA's ability to use 1547's capabilities or for allowing individual DERs or microgrids that are disconnected in emergencies to still fulfill their obligations to other resources in the aggregation?

Response: IEEE 1547 is not designed to regulate circuit voltage. It is a standard that governs when an inverter is to be disconnected from the power system when voltages become out of tolerance. As noted in Question 2, PSE&G has some concerns in the areas of voltage regulation and the ability to perform "live" line work. From a voltage regulation perspective, it is unclear how the DERA will be set up. Although some inverters have the capability to perform some voltage regulation functions, the potentially large quantity of individual inverters in a DERA or on a circuit could make this very difficult to manage. From a "live" line work perspective, IEEE 1547 is concerning. IEEE 1547 has standard settings, where if the voltage drops below a certain threshold for a certain amount of time, then the PV system is isolated. It is unclear whether the time delay is compatible with "live" line work in large scale DER applications. Additionally, IEEE 1547 includes "ride through" capability so that the PV system can detect a temporary "voltage sag" event and allow the PV system to remain on line. Again, it is unclear whether the "ride through" capability is compatible with safe "live" line work.

As the structure of the DERA remains unclear, PSE&G is unsure of any limitations of the

DERA's ability to use IEEE 1547 or allowing the DERA to fulfill obligations in an emergency.

11. Does your EDC have any plans to prepare for Order No. 2222's implementation by means of launching pilot DERA program(s)? If so, please provide details on the pilot program, such as timelines and potential planned phases, and how the pilot will support subsequent DERAs. Please provide justification for why a pilot program is needed prior to full deployment and explain what the anticipated benefits of such a pilot program are.

Response: While not directly related to preparation for Order No. 2222, the Company has both existing aggregations of DER resources and plans for new DER aggregation programs.

- The Company has operated its Solar 4 All pole top program for almost 15 years, which consists of approximately 160,000 individual solar panels aggregated into a large solar resource.
- The Company currently aggregates its Energy Efficiency resources to offer into the PJM capacity market, as required by the BPU Energy Efficiency Framework Order of June 10, 2020.
- The Company has filed under its CEF-EE II program to offer Demand Response programs to customers in its service territory. See Docket # QO23120874 for details on the program offerings.

12. Does your EDC have procedures in place in the event that a DERA or a Component DER's Registration review period goes past 60 days and is granted additional time for the review?

Response: PSE&G does not current have DERA procedures in place as PJM's governing manual changes have not been finalized.

Questions for All New Jersey Stakeholders

13. Do you have any comments or concerns about the classification of certain resources and their operating profiles as eligible for DERAs? Please state any associated control and/or compensation concerns.

Response: It is crucial to allot sufficient time to adequately study DERAs for potential impacts to distribution safety and reliability, including the safety of PSE&G's personnel that perform live line work. DERs acting in a coordinated fashion may behave differently from individual DERs - both with how they produce real and reactive power on the grid. Accordingly, it is important that EDCs have the opportunity to study the DERAs to ensure distribution equipment is capable of remaining within safe operating limits.

14. Do you believe that it is technically feasible to implement Order No. 2222 requirements by PJM's originally proposed 2026 implementation deadline? If not, please explain in detail why not. Are there any actions that PJM or NJBPU could take to make the implementation more efficient and timely?

Response: The timeline is concerning given PJM has not yet worked with stakeholders to develop the processes needed to implement Order No. 2222. The feasibility of the 2026 implementation deadline is dependent on the magnitude of required system enhancements required to enable the Order 2222 functionality. Implementation of Order No. 2222 will need to be carefully developed to avoid jeopardizing system reliability and safety.

15. Do you have any comments or questions about dispute resolution processes between DERAs and utilities?

Response: PSE&G is aligned with PJM's proposed dispute resolution processes between DERAs and utilities.

16. How should DER Aggregator performance be monitored/tracked/reported to the public?

Response: PSE&G advocates for continued discussion among BPU and other regulatory agencies, the utilities, and other relevant stakeholders on how best to identify and monitor who receives the benefits of DER services and the valuation of those benefits, and the logistics of reporting that data to the public.

17. Should each EDC be required to formally establish pilot programs demonstrating their procedures and performance for DERA integration? Should these pilots be identical/consistent/unique across EDCs?

Response: PSE&G believes that programs operated by the Utility seeking to aggregate Energy Efficiency, Demand Response, or Flexible Load Management resources using various DER technology types should be considered under the Board's Energy Efficiency/Peak Demand Reduction program framework. PSE&G suggests these programs or pilots do not need to be identical across the EDCs to gain more insight and knowledge about alternate programs.

18. As part of NJBPU's efforts to help implement Order No. 2222 how much technical support from the NJBPU, separate from NJBPU's current Grid Modernization Forum working groups, is desired? Would a statewide stakeholder engagement process, working group, technical conference, or public platform for stakeholder engagement be beneficial?

Response: The creation of a working group among the BPU, the EDCs and other relevant stakeholders to address specific and discrete issues related to the implementation of Order No. 2222 would be beneficial. The timing of any State effort should align with implementation discussions at PJM.

19. Are there any specific questions that you have for NJBPU that has not been addressed yet in the FERC Order, PJM's Compliance Filings, or NJBPU's Order No. 2222 outreach efforts?

Response: PSE&G looks forward to further details regarding the planned PJM manual updates related to Settlement and Metering requirements for Order 2222. Having further

details will help in understanding the modifications to existing systems which will be required.

20. Which of the following categories best describes the stakeholder perspective your comments provide?

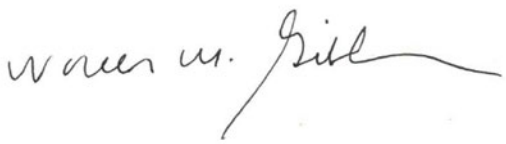
    a. DER Aggregator
    b. Government Agency
    c. Concerned Citizen/Building Owner
    d. Academic Institution
    e. Commercial DER Developer
    f. Energy Asset Investor/Owner

Response: PSEG does not fit within any of the categories listed above. PSEG is a public utility holding company consisting primarily of a regulated electric and gas utility and a nuclear generating business.

Conclusion

Thank you for the opportunity to respond to these important questions. Please let us know if you need any further information related to the foregoing.

Very truly yours,



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