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The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E. Room 1A
Washington, D.C. 20426

Re: *Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators, Docket No. RM18-9-000*

Dear Secretary Bose,

Pursuant to the September 5, 2019 Request for Information of Federal Energy Regulatory Commission ("FERC" or "Commission") Staff filed in the above-referenced proceeding,[1] PJM Interconnection, L.L.C. ("PJM") hereby submits the following responses to the questions presented. Please do not hesitate to contact the undersigned with any questions or concerns regarding this submission.

Respectfully submitted,

/s/ Thomas DeVita

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[1] *PJM Interconnection, L.L.C.*, Request for Information of Commission Staff, Docket No. RM18-19-000 (Sept. 5, 2019) ("September 5 Request for Information").

A. RESPONSES TO REQUEST FOR INFORMATION

1. *Under your RTO's/ISO's existing rules for small generator interconnection, if a DER seeks to participate in wholesale markets and plans to interconnect at the distribution level, please describe the step-by-step process by which that resource would interconnect to the system.*

PJM Response:

PJM applies the same study[2] process to Small Generation Resources[3] interconnecting to a non-FERC-jurisdictional distribution facility and requesting to make wholesale sales into the PJM market as it does for FERC-jurisdictional interconnections of Small Generation Resources. However, in the former instance the Interconnection Customer must request physical interconnection service through the relevant state-jurisdictional process. For FERC-jurisdictional interconnections, as contemplated by Order No. 2003 and as clarified by the Commission in Docket Nos. ER06-407-000 and ER06-408-000, please see the PJM Small Generator Interconnection Procedures located in the PJM Tariff, Part IV, Subpart G, and PJM Manual 14G (in particular, Attachments C and D).

As further described in PJM Manual 14A, there are two New Service Queue windows per year under the PJM Tariff for PJM to accept Interconnection Requests. Each window is open for six months: the first queue window closes on March 31st of the calendar year, and the second queue window closes on September 30th of the same calendar year.

After a valid Interconnection Request is received, PJM will establish a time to hold a scoping meeting as described in the Tariff, section 36.1.5. Generation Interconnection Requests that are 20 MWs or less, or increases in capability of 20 MW or less for existing generation, are governed by the Tariff, Part IV, Subpart G, and PJM Manual 14G, section 5.

Following the scoping meeting, PJM and the Interconnected Transmission Owner will conduct the Generation or Transmission Interconnection Feasibility Study. In general, the study will be completed within 90 days during the next Feasibility Study Cycle. PJM, in coordination with any affected Interconnection Transmission Owner(s), will conduct Generation Interconnection Feasibility Studies two times each year. The Feasibility Study assesses the practicality and cost of incorporating the generating unit or increased generating or transmission

[2] Note that a subset of resources may be eligible for screen procedures that are distinct from the studies described here.

[3] Terms not otherwise defined herein shall have the same meaning as established under the PJM Open Access Transmission Tariff ("Tariff") and the Amended and Restated Operating Agreement of PJM Interconnection, L.L.C. ("Operating Agreement").

capacity into the PJM system. The analysis is limited to short-circuit studies and load-flow analysis, and does not include stability analysis. The study also focuses on determining preliminary estimates of the type, scope, cost and lead time for construction of facilities required to interconnect the project. Results of the study for the requested interconnection service (Capacity Resource or Energy Resource) are provided to the Interconnection Customer and the affected Interconnection Transmission Owners, and are published on the PJM web site. Confidentiality of the Interconnection Customer is maintained in these reports, but the location of the project and size (in megawatts) is identified.

After reviewing the results of the Generation or Transmission Interconnection Feasibility Study, the Interconnection Customer must decide whether or not to pursue completion of the System Impact Study.[4] The System Impact Study is a comprehensive regional analysis of the impact of adding a new generation and/or transmission facility to the system and an evaluation of the facility's impact on deliverability to PJM load in the particular PJM region where the generator and/or new transmission facility is located. This study identifies the system constraints relating to the project and the necessary Attachment Facilities,[5] Local Upgrades, and Network Upgrades. The Study refines and more comprehensively estimates cost responsibility and construction lead times for facilities and upgrades. Relationships are studied between the new generator or the new transmission facility, other planned new generators in the queue, and the existing system as a whole. This study also encompasses an analysis of existing firm and non-firm Transmission Service requests. PJM, in coordination with any affected Interconnection Transmission Owner(s), conducts System Impact Studies two times each year. For some Small Generation Resources, there may be an opportunity to expedite the study process as described in Manual 14G, section 5.4.[6]

The System Impact Study includes AC powerflow analysis, short circuit analysis, and may include stability analysis. The powerflow analysis can include different sets of analyses at various load levels such as summer peak, light load, and winter peak. All powerflow analysis is performed consistent with PJM Reliability Planning Criteria. Similarly, the stability analysis can include different sets of analyses at various load levels such as summer peak, light load, and winter peak.

Results of the System Impact Study are provided to all Interconnection Customers who had

[4] Each Interconnection Request is studied on a summer peak Regional Transmission Expansion Plan ("RTEP") base case with the case year dependent on the New Services Queue under study. PJM will identify the base case year to be used in the study of a specific queue on its website. Both load flow and short circuit cases will use the same base case year.

[5] Authority over specifying Attachment Facilities follows the jurisdiction of the physical interconnection.

[6] *See* Tariff, Subpart G, section 110.

projects evaluated in the study and to affected Interconnected Transmission Owners and are posted on the PJM web site. The identity of all Interconnection Customers, the size, and the location of projects for which System Impact Studies have been completed are published on the PJM web site. Upon receipt of the System Impact Study report, the Interconnection Customer will receive a Generation Interconnection Facilities Study Agreement, or, if a Generation Interconnection Facilities Study is not required, the Interconnection Customer will be tendered an Interconnection Service Agreement ("ISA"), or a Wholesale Market Participation Agreement ("WMPA") if not a FERC-jurisdictional interconnection. The Interconnection Customer must then decide whether or not to proceed.

a. *What are the respective roles of the RTO/ISO and the distribution utility in that process?*

PJM Response:

If the Small Generation Resource is subject to the Tariff (meaning the interconnection is FERC-jurisdictional), the PJM and utility roles are the same as for an Interconnection Request to transmission. If the Small Generation Resource is not subject to the Tariff (a non-FERC-jurisdictional interconnection), then PJM's primary role will be to study impacts to the Transmission System, and provide access to its wholesale markets through a WMPA entered into among PJM, the Interconnection Customer, and the Interconnected Transmission Owner. However, as stated in the prior response, the requirements to physically interconnect the generator to the distribution system will be subject to the applicable state-jurisdictional process through the state tariff and distribution utility interconnection agreement.

b. *How would the DER ascertain whether it must interconnect pursuant to a state-jurisdictional interconnection process or a Commission-jurisdictional process?*

PJM Response:

If the Interconnection Customer desires to participate in PJM wholesale markets, it must enter the PJM New Services Queue. As part of entering the New Services Queue, the threshold jurisdictional determination of whether the interconnection is subject to the PJM Tariff or a state-jurisdictional process is generally discussed on the scoping call, when the Point of Interconnection is confirmed.

c. *How does your RTO/ISO define the physical boundaries of a distribution facility when determining whether a distribution facility to which a new DER seeks interconnection is already subject to an Open Access Transmission Tariff (OATT) for purposes of making wholesale sales?*

PJM Response:

A distribution interconnection request is determined to be FERC-jurisdictional if: (i) the generation facility meets the requirements of a Qualifying Facility (and has certified as a Qualifying Facility prior to coming into the New Services Queue), or (ii) there have been FERC-jurisdictional transactions on the distribution facility at the proposed Point of Interconnection prior to the Interconnection Request being submitted to PJM. The determination of whether or not a distribution facility is subject to the PJM Tariff is case-specific and based on the facts and circumstances presented.

2. *Does the interconnection process described in response to Question# 1 differ based on whether or not the DER is a Qualifying Facility, and if so, how?*

PJM Response:

Pursuant to Order No. 2003-A at P 735, n. 168, FERC exercises jurisdiction over the interconnections of Qualifying Facilities seeking to interconnect to a non-OATT "distribution" facility to make jurisdictional wholesale sales. Consequently, in PJM such interconnections are studied pursuant to the PJM Tariff and are required to execute PJM's ISA.

3. *Does the interconnection process described in response to Question# 1 differ if the DER seeking to participate in wholesale markets is interconnecting behind a retail customer meter (whether on the distribution or transmission system), and if so, how?*

PJM Response:

Participation in PJM wholesale markets is limited to the *export* capabilities of the generation facility. This means that generation output consumed behind the Point of Interconnection is not considered wholesale. However, the interconnection process described in response to Question #1 is the same.

4. *Does the interconnection process described in response to Question# 1 allow studies for bi-directional service (i.e., both from a DER to the transmission system and from the transmission system to a distribution-connected wholesale customer)?*

PJM Response:

Yes; however, this is done only for energy storage devices capable of charging from the grid.

5. *Under the interconnection process described in response to Question# 1, and assuming all of the individual DERs in the aggregation are new resources, which of the following would apply: (1) an aggregation of DERs located at multiple points of interconnection would be studied as one aggregated resource by your RTO/ISO and require only a single Generator Interconnection Agreement (GIA); (2) each individual DER would be studied individually and require its own GIA; (3) each DER would be studied individually with the aggregation still only requiring a single GIA; or (4) a different approach (please describe if a different approach would be used).*

PJM Response:

For purposes of generation interconnection, the PJM Tariff does not contain processes specific to the aggregation of resources. Accordingly, Scenario (2) would apply—each individual DER would be studied individually and require its own ISA or WMPA, as applicable.

6. *In contrast with the scenario in Question # 5, please assume that at least some of the individual DERs in a proposed aggregation are existing resources already interconnected and in service. If multiple existing and new DERs were able to aggregate at separate points of interconnection across your RTO/ISO to participate in wholesale markets as an aggregation rather than as individual resources, under what circumstances would your RTO's/ISO's existing interconnection procedures and study processes apply to the individual DERs in the aggregation? If multiple existing and new DERs were able to aggregate at separate points of interconnection across your RTO/ISO to participate in wholesale markets as an aggregation rather than as individual resources, under what circumstances would your RTO's/ISO's existing interconnection procedures and study processes apply to the aggregation? Would any revisions be needed to accommodate aggregations of DERs (existing and new) at multiple points of interconnection?*

PJM Response:

For purposes of generation interconnection, the PJM Tariff does not contain processes specific to the aggregation of resources, and accordingly Tariff revisions would likely be required to specifically accommodate aggregations of DERs (existing and new) at multiple points of interconnection.

a. Under existing tariff rules, which entity (i.e., the RTO/ISO or the distribution utility) would be responsible for processing the interconnection of the individual DERs seeking to join an aggregation?

PJM Response:

As stated above, for purposes of generation interconnection, the PJM Tariff does not contain processes specific to the aggregation of resources. Any Small Generation Resource wishing to participate in PJM's wholesale markets would need to submit an Interconnection Request to PJM and enter the PJM New Services Queue.

b. For existing DERs that are currently not participating in wholesale markets and that interconnected under a state-jurisdictional process, under your current interconnection procedures would the DER's decision to participate in an aggregation trigger the RTO/ISO interconnection process? Would additional studies be necessary to ensure that participation in your RTO's/ISO's wholesale markets through an aggregation does not cause reliability problems on the transmission system? If so, what studies? If not, why not? For example, would the original state-jurisdictional interconnection process have already studied the DER in a variety of operational scenarios that eliminate the need for further studies prior to wholesale market participation in your region?

PJM Response:

As stated above, for purposes of generation interconnection, the PJM Tariff does not contain processes specific to the aggregation of resources. Any wholesale market participation would need to be coordinated through PJM. If the facility were a Qualifying Facility selling directly to the distribution utility under the Public Utility Regulatory Policies Act ("PURPA"), it would not be required to submit an Interconnection Request and enter the New Services Queue. Rather, the generation facility would simply request to execute a PJM ISA as a non-queue generator, provided the generation facility intended to continue operating in the same manner as it did under PURPA. Otherwise, any Small Generation Resource wishing to participate in PJM's wholesale markets would need to submit an Interconnection Request to PJM and enter the PJM New Services Queue.

c. *If existing distribution-level DERs that are currently not participating in wholesale markets join aggregations and start making wholesale sales for the first time, how would that new wholesale use of existing DERs and their associated distribution facilities impact your assessment of whether those distribution facilities are subject to your OATT? Would Commission-jurisdictional interconnection procedures apply to subsequent requests to interconnect to those distribution facilities?*

PJM Response:

As stated above, for purposes of generation interconnection, the PJM Tariff does not contain processes specific to the aggregation of resources. If the unit is a behind-the-meter generator that wants to come out from behind-the-meter and make wholesale sales into the market, the unit would have to submit a new Interconnection Request and enter the New Services Queue. If the facility were a Qualifying Facility under PURPA selling its power to the host utility, the generator would submit a non-queue request to receive an ISA. Any associated distribution facilities over which wholesale sales occurred would become subject to the PJM Tariff for purposes of any subsequent interconnections.

d. *For large and small generator interconnections subject to Order Nos. 2003 and 2006, the transmission provider is required to coordinate between the interconnection customer and "affected systems" (i.e., third-party transmission systems) to ensure that any needed affected system issues are resolved. With respect to new DERs seeking to interconnect to distribution facilities that are subject to a Commission-jurisdictional OATT, do the relevant small generator interconnection procedures in your region treat the transmission system to which the relevant distribution facilities are connected as an "affected system" in order to address any needed transmission upgrades at the initial interconnection stage?*

PJM Response:

Under the PJM Tariff, all generation Interconnection Requests enter the New Services Queue, and are studied for potential transmission system impacts. PJM does not treat transmission systems or distribution systems between utilities in the PJM Region as “affected systems.”

7. *If the individual DERs in an aggregation are seeking to interconnect to a combination of distribution facilities, some of which are subject to a Commission- jurisdictional OATT and some that are not subject to an OATT, would any, all, or only a subset of the DERs in the aggregation be required to go through the interconnection process you described in response to Question #1 and to execute GIA(s) under your tariff? Please explain.*

PJM Response:

As stated above, for purposes of generation interconnection, the PJM Tariff does not contain processes specific to the aggregation of resources. Regardless of whether the generation facility is interconnecting to a FERC-jurisdictional or non-FERC jurisdictional facility, all generation facilities intending to make wholesale sales must enter the PJM New Services Queue to be studied under the PJM Tariff, Parts IV and VI. The key difference would be that if the generation facility were interconnecting to a FERC-jurisdictional facility, it would be required to execute an ISA. By contrast, if the generation facility were interconnecting to a non-FERC-jurisdictional facility to make wholesale sales into PJM markets (and if it were not a Qualifying Facility or the applicable distribution facility did not have prior wholesale sales across it), it would be required to execute a WMPA with PJM and the Interconnected Transmission Owner, and would be required to go through the relevant state-jurisdictional interconnection process and execute a state-jurisdictional interconnection agreement.

8. *If available, please provide data on or estimates of the number of individual DERs in your region that are directly participating today in your RTO/ISO markets as compared to DERs in your region that are not participating in wholesale markets. If possible, please provide estimates by resource type and participation model (i.e., generator, demand response, etc.)*

PJM Response:

PJM does not currently possess precise data or estimates regarding the information described in this question. While each resource participating in PJM markets must have an executed WMPA or ISA, if a resource is *not* participating in PJM's wholesale markets, PJM does not possess or retain precise information or documentation regarding that resource.

9. *Do you or the distribution utilities in your region have data on or estimates of how many distribution facilities, as defined in your answer to Question #1.c. above, are currently subject to an OATT compared to the total number of distribution facilities in the RTO/ISO footprint?*

    a. *If yes, please provide this data or estimates.*
    b. *How is this information managed and updated?*

PJM Response:

PJM does not maintain such data or estimates. PJM cannot speak to the particular data sets or estimates, if any, that are maintained by distribution utilities regarding non-OATT distribution facilities, as those facilities are not under PJM's operational control.

10. *Is your RTO/ISO engaged in any ongoing discussion or coordination with state or local authorities regarding the interconnection process for DERs? If so, please describe this discussion or coordination.*

PJM Response:

PJM participated in the Maryland PC-44 process, which examined, among other things, the applicability of Maryland jurisdiction to the interconnection of wholesale DER. PJM has also engaged with several state authorities formally and informally regarding DER ride-through capability, including those in Ohio, Pennsylvania, Washington, D.C., and Michigan. PJM also authored a comparison of state interconnection procedures, including potential applicability to wholesale DER, and sought feedback from state commissions prior to publication.[7]

11. *If a DER needs to transmit its output over distribution facilities to make sales into the RTO/ISO markets, are there any existing tariff provisions that govern such service? If so, please list and describe such provisions and describe whether that service is bi-directional.*

PJM Response:

The owner of the relevant distribution facilities may be entitled to charge for wholesale distribution service, the rates for which would be filed with the Commission, and, if accepted, be included in the Interconnected Transmission Owner's Attachment H to the PJM Tariff.

[7] Available here: https://www.pjm.com/-/media/committees-groups/subcommittees/ders/postings/state-interconnection-regulations-scopes-and-screens.ashx?la=en