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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: PJM Interconnection L.L.C., Docket Nos. EL19-100-000
Compliance Filing Regarding Minimum Run Duration Requirements*

Dear Secretary Bose:

Pursuant to the October 17, 2019 Order of the Federal Energy Regulatory Commission (“Commission”) in the above referenced proceeding,¹ PJM Interconnection, L.L.C. (“PJM”) submits this compliance filing to incorporate rules pertaining to qualifications for all Capacity Resources² in PJM’s Reliability Assurance Agreement Among Load Serving Entities in the PJM Region (“RAA”). Consistent with the Commission’s October 17 Order, this filing incorporates PJM’s rules for determining capacity values of all resources into RAA, Schedule 9.³ Separately, also as directed in the October 17 Order, PJM will submit a brief regarding the reasonableness of the ten hour duration requirement as applied to Capacity Storage Resources.⁴

¹ *PJM Interconnection, L.L.C.*, 169 FERC ¶ 61,049 (Oct. 17, 2019) (“October 17 Order”).

² For the purpose of this filing, capitalized terms not defined herein shall have the meaning as contained in the PJM Open Access Transmission Tariff, Amended and Restated Operating Agreement of PJM Interconnection, L.L.C., or the Reliability Assurance Agreement Among Load Serving Entities in the PJM Region.

³ As required by RAA, section 16.4, the PJM Board of Managers approved the proposed revisions contained within the RAA, Schedule 9 at its December 4, 2019 meeting.

⁴ Consistent with the Commission’s Notice of Extension of Time, PJM intends to submit its initial brief on or before March 11, 2020.

PJM respectfully requests that the Commission find this filing complies with the directive to include the relevant rules for determining the capability of all Capacity Resources into the PJM tariff. Consistent with the Commission's opening of a separate Section 206 proceeding, PJM requests that stakeholders, and ultimately the Commission, address issues surrounding the reasonableness of the application of PJM's existing ten hour duration requirement for generating units with limited energy capability *after* PJM submits its separate brief on this topic.⁵ In short, PJM urges the Commission to find that this filing meets the narrow compliance obligation set forth in paragraph 140 of the October 17 Order, while reserving the reasonableness of the ten hour duration requirement in the separate paper hearing as provided in paragraph 142 of that order.

I. BACKGROUND

On October 17, 2019, the Commission accepted⁶ PJM's proposed revisions to the Open Access Transmission Tariff ("Tariff") and Amended and Restated Operating Agreement ("Operating Agreement") filed in compliance with the requirements of Order No. 841.⁷ In accepting the filing, the Commission directed PJM to submit tariff provisions in a compliance filing that reflects PJM's minimum run-time rules and procedures applicable to all Capacity Resources.⁸

⁵ The Commission granted PJM's motion for extension to submit initial briefs by March 11, 2019. *See PJM Interconnection, L.L.C.*, Notice of Extension of Time (Dec. 6, 2019).

⁶ October 17 Order at P 2.

⁷ *Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Order No. 841, 162 FERC ¶ 61,127 (2018), order on reh'g, Order No. 841-A, 167 FERC ¶ 61,154 (2019).

⁸ October 17 Order at P143. The Commission simultaneously instituted an investigation pursuant to section 206 of the Federal Power Act and initiated a paper hearing to investigate whether PJM's existing minimum run-time rules and procedures are unjust, unreasonable, unduly discriminatory or preferential as applied to Capacity Storage Resources. *Id.* at 141-142. A separate brief will be filed address the Commission's investigation in this docket.

II. SATISFACTION OF THE COMPLIANCE REQUIREMENTS OF THE OCTOBER 17 ORDER.

PJM interprets the Commission’s directive to incorporate the “minimum run-time” rules for all resources in the tariff to mean the PJM Manual provisions that the current RAA, Schedule 9 refers to as the “rules and procedures [that] recognize the difference in types of generating units and the relative ability of units to maintain output at stated capability over a specified period of time.”⁹ PJM notes this clarification because, in PJM, “minimum run-time” is commonly used to refer to a seller-defined parameter of an energy market offer, specifying that a resource must be dispatched and compensated for running for a certain minimum number of hours if it is to be dispatched at all.¹⁰ The October 17 Order, by contrast, uses the term “minimum run-time” to describe the PJM Manual rules for determining the capability of differing resource types for Capacity Resource qualification purposes.¹¹

A. Rules and Procedures Governing Qualification of Capacity Resources

The RAA “is intended to ensure that adequate Capacity Resources . . . will be planned and made available to provide reliable service to loads within the PJM Region”¹² and provides the framework for resource adequacy within PJM. It describes the nature of Capacity Resources as “specific, firm Capacity Resources that are capable of supplying the energy requirements of [Load-Serving Entities’] load[s] on a firm basis without interruption for economic conditions and with

⁹ October 17 Order at P 139, quoting RAA Schedule 9.

¹⁰ See Operating Agreement, Schedule 1, section 6.6, and parallel provisions of Tariff, Attachment K-Appendix, section 6.6

¹¹ October 17 Order at PP 139-140.

¹² RAA, Article 2.

such other characteristics that are necessary to support the reliable operation of the PJM Region.”¹³

To ensure that reliable service is planned and made available to serve PJM loads, the rules pertaining to the qualification, or determination of capacity values, for all Capacity Resources except for Demand Resources¹⁴ are currently referenced in RAA, Schedule 9 and fully detailed in PJM Manual 21: Rules and Procedures for Determination of Generating Capability (“PJM Manual 21”). Taken together, RAA, Schedule 9 and PJM Manual 21¹⁵ ensure that adequate Capacity Resources are planned and made available to provide reliable service to loads within the PJM Region.

Capacity Resources procured for this purpose are expected to be capable of supplying the energy requirements of loads within the PJM Region on a firm basis without interruption. Consistent, however, with RAA, Schedule 9’s recognition of “the difference in types of generating units and the relative ability of units to maintain output at stated capability over a specified period of time,” PJM’s procedures for determining the capability of Capacity Resources appropriately recognize physical limitations associated with certain types of generating units. For instance, resources that cannot supply energy on a continuous basis without interruption due to the need to replenish stored energy capability in preparation for the next daily load cycle, or resources with output that varies as a function of an energy source that is non-continuous and that cannot be directly controlled, are not able to supply energy on a firm basis without interruption.¹⁶ While

¹³ RAA, Article 7, section 6.

¹⁴ For Demand Resources, the RAA defines Annual Demand Resource as being capable of maintain interruptions between the hours of 10am to 10pm during summer periods and 6am through 9pm during the non-summer periods.

¹⁵ PJM, Manual 21: Rules and Procedures for Determination of Generating Capability (rev. 14, August 1, 2019), <https://www.pjm.com/-/media/documents/manuals/m21.ashx> (“Manual 21”).

¹⁶ As will be more thoroughly explained in PJM’s brief with respect to PJM’s application of minimum duration requirements to determine the capability of Capacity Storage Resources, different procedures for establishing the

such resources are still allowed to participate as Capacity Resources, they must be de-rated at a level determined to provide reliability comparable with all other Capacity Resources to ensure reliable service to loads within the PJM Region.

In accordance with the Commission's October 17 Order, this filing incorporates the existing rules for determining the capacity values of Capacity Resources that are currently in the PJM Manual into RAA, Schedule 9. PJM does so by grouping them in three categories of resources, i.e., generating units: (1) that are able to maintain a stated level of output without interruption for an extended period of time, (2) with limited energy capability, or (3) with output that varies as a function of energy source that is non-continuous and cannot be directly controlled.¹⁷ These existing categories account for the operational differences of various resources and are used to determine the capacity value available to be offered as a Capacity Resource.

1. Generating Units That Are Able to Maintain a Stated Level of Output Without Interruption for An Extended Period of Time.

Generating units in this first category are characterized by the ability to provide a stated level of output when needed and maintain continuous output at the stated level for an extended period of time without interruption. Such generation may include nuclear, steam, combined cycle, reciprocating engine, fuel cell, and combustion turbine units. The capacity value for generating units with continuous and uninterrupted energy capability are determined based on the level of output that the unit is capable of providing under ambient conditions that are expected to exist

capacity values of different resource categories are appropriate where necessary to reflect differing inherent, physical, or operational limitations of each resource category.

¹⁷ The determination of capacity values for Demand Resources are not included in this filing or in Manual 21 since those values are provided in the Demand Resources' Sell Offer Plan in accordance with RAA, Schedule 6 and the parallel provisions of Tariff, Attachment DD-1.

during PJM system peak loads.¹⁸ Such conditions include, but are not limited to, air temperature, humidity, barometric pressure, intake water temperature, and cooling system performance.

Consistent with this methodology, PJM proposes to add the following language to RAA, Schedule 9, section C, as shown in blackline below:

i. For generating units having the ability to maintain output at stated capability continuously on a daily basis without interruption, the capability of the generating unit is based on the level of output that the unit can provide under the site conditions expected to exist at the time of PJM system peak load where such conditions include, but are not limited to, ambient air temperature, humidity, barometric pressure, intake water temperature, and cooling system performance. Generating units with the ability to operate continuously across all hours of an operating day without interruption if needed include, but are not limited to, nuclear and fossil-fired steam units, combined cycle units, combustion turbine units, reciprocating engine units, and fuel cell units.

2. *Generating Units with Limited Energy Capability.*

The capacity value for generating units with limited energy capability is currently determined based on the stated level of output that such resource can sustain over a continuous ten hour duration. In other words, the capability of generating units that are able to provide a stated level of output for only a portion of each operating day before being depleted but need to replenish stored energy capability in preparation for the next daily operating cycle, which include all Capacity Storage Resources, is determined by dividing the resource's storage capability (in MWh) by 10 hours but not to exceed the resource's nameplate rating.¹⁹ For example, the capacity value of a Capacity Storage Resource with 1,000 MWh of storage capability and with a 100 MW

¹⁸ See PJM Manual 21, section 1.2.

¹⁹ As previously explained, this ten hour continuous duration requirement is used only for purposes of determining the capacity value of generating units with limited energy capability. There is no requirement that Capacity Storage Resources self-schedule or make available its capacity value over a prescribed set of hours.

nameplate rating is 100 MW, whereas, the capacity value of a Capacity Storage Resource with 100 MWh of storage capability and with a 100 MW nameplate rating is 10 MW.

Consistent with this methodology,²⁰ PJM is adding the following language to RAA, Schedule 9, section C, as shown in blackline below:

ii. Generating units with limited energy capability include, but are not limited to, Energy Storage Resources that receive energy from the grid and store the energy for later injection to the grid (e.g., pumped storage hydro units, compressed air energy storage units, flywheel energy storage units and battery storage units) and hydroelectric generating units with reservoir storage capability. The capability of generating units with limited energy capability is based on the sustained level of output that the unit can provide and maintain over a continuous ten-hour period with consideration given to conditions expected to exist at the time of PJM system peak load to the extent that such conditions impact such capability.

3. Generating Units with Output That Varies as a Function of Energy Source That is Non-Continuous and Cannot be Directly Controlled.

Generating units with output that varies as a function of an energy source that is non-continuous and cannot be directly controlled are characterized by the inability to provide or maintain a stated level of output on demand due to the non-continuous and uncontrollable nature of their energy source. These resources, such as wind or solar generating units, cannot be expected to provide a stated level of output on demand as their production is dependent on the sun or the wind. In short, a solar array cannot compel the sun to always shine, nor can a wind turbine compel the wind to always blow.

Because of this inherent resource limitation, PJM defines the capacity values of such resources by the level of output that their energy source is allowing them to reliably produce at the

²⁰ Given that this compliance filing is limited to only incorporating the existing rules for determining capacity values into RAA, Schedule 9, PJM intends to submit a separate brief, by March 11, 2020, that will address the Commission's investigation regarding the reasonableness of the ten hour duration requirement as applied to Capacity Storage Resources.

time of system peak loads. Specifically, the capacity value of wind and solar generating units is determined by the unit's average output provided in the 368 hours of hours ending 15, 16, 17 and 18 of each day in June, July, and August.²¹

Consistent with this methodology, PJM is adding the following language to RAA, Schedule 9, section C, as shown in blackline below:

iii. Generating units with output that varies as a function of an energy source that is non-continuous and that cannot be directly controlled are unable to provide a stated level of output on demand and are unable to maintain a stated level of output for any specified period of time include, but are not limited to, wind units, solar units, run-of-river hydroelectric units (without reservoir storage capability) and landfill gas units (without alternate fuel capability). The capability of such generating units is based on the level of output that the unit is expected to be reliably producing as a function of its energy source at the time of system peak loads. Specifically, the capability of a wind or a solar generating unit is determined by the unit's average hourly MW output during 368 summer-period hours defined by hours ending 15, 16, 17 and 18 of each day of the months of June, July and August.

V. COMMUNICATIONS

Correspondence and communications with respect to this filing should be sent to the following persons:

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²¹ See PJM Manual 21, Appendix B.

VI. SERVICE

PJM has served a copy of this filing on all PJM Members and on all state utility regulatory commissions in the PJM Region by posting this filing electronically. In accordance with the Commission's regulations,²² PJM will post a copy of this filing to the FERC filings section of its internet site, located at the following link: <http://www.pjm.com/documents/ferc-manuals.aspx> with a specific link to the newly-filed document, and will send an e-mail on the same date as this filing to all PJM Members and all state utility regulatory commissions in the PJM Region²³ alerting them that this filing has been made by PJM today and is available by following such link.

VII. CONCLUSION

PJM respectfully requests that the Commission accept this compliance filing, with an effective date of December 3, 2019.

Respectfully submitted,



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On behalf of PJM Interconnection, L.L.C.

²² See 18 C.F.R §§ 35.2(e) and 385.2010(f)(3).

²³ PJM already maintains, updates, and regularly uses e-mail lists for all PJM members and affected commissions.

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Audubon, this 12th day of December 2019.



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Attachment A

Revisions to the PJM Reliability Assurance Agreement

(Marked / Redline Format)

SCHEDULE 9

PROCEDURES FOR ESTABLISHING THE CAPABILITY OF GENERATION CAPACITY RESOURCES

- A. Such rules and procedures as may be required to determine and demonstrate the capability of Generation Capacity Resources for the purposes of meeting a Load Serving Entity's obligations under the Agreement shall be developed by the Office of Interconnection and maintained in the PJM Manuals.
- B. The rules and procedures for determining and demonstrating the capability of generating units to serve load in the PJM Region shall be consistent with achieving uniformity for planning, operating, accounting and reporting purposes.
- C. The rules and procedures shall recognize the difference in types of generating units and the relative ability of units to maintain output at stated capability over a specified period of time. Factors affecting such ability include, but are not limited to, fuel availability, stream flow and/or reservoir storage for hydro units, ~~reservoir~~energy storage capability for ~~hydro and pumped storage units~~Energy Storage Resources, energy source variability and intermittency, mechanical limitations, and system operating policies. For this purpose, the basis for determining and demonstrating the capability of a particular generating unit is dependent upon the category (of the three generating unit types listed below) that describes the unit's attributes.
- i. For generating units having the ability to maintain output at stated capability continuously on a daily basis without interruption, the capability of the generating unit is based on the level of output that the unit can provide under the site conditions expected to exist at the time of PJM system peak load where such conditions include, but are not limited to, ambient air temperature, humidity, barometric pressure, intake water temperature, and cooling system performance. Generating units with the ability to operate continuously across all hours of an operating day without interruption if needed include, but are not limited to, nuclear and fossil-fired steam units, combined cycle units, combustion turbine units, reciprocating engine units, and fuel cell units.
- ii. Generating units with limited energy capability include, but are not limited to, Energy Storage Resources that receive energy from the grid and store the energy for later injection to the grid (e.g., pumped storage hydro units, compressed air energy storage units, flywheel energy storage units and battery storage units) and hydroelectric generating units with reservoir storage capability. The capability of generating units with limited energy capability is based on the sustained level of output that the unit can provide and maintain over a continuous ten-hour period with consideration given to conditions expected to exist at the time of PJM system peak load to the extent that such conditions impact such capability.

iii. Generating units with output that varies as a function of an energy source that is non-continuous and that cannot be directly controlled are unable to provide a stated level of output on demand and are unable to maintain a stated level of output for any specified period of time include, but are not limited to, wind units, solar units, run-of-river hydroelectric units (without reservoir storage capability) and landfill gas units (without alternate fuel capability). The capability of such generating units is based on the level of output that the unit is expected to be reliably producing as a function of its energy source at the time of system peak loads. Specifically, the capability of a wind or a solar generating unit is determined by the unit's average hourly MW output during 368 summer-period hours defined by hours ending 15, 16, 17 and 18 of each day of the months of June, July and August.

Attachment B

Revisions to the PJM Reliability Assurance Agreement

(Clean Format)

SCHEDULE 9

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- C. The rules and procedures shall recognize the difference in types of generating units and the relative ability of units to maintain output at stated capability over a specified period of time. Factors affecting such ability include, but are not limited to, fuel availability, stream flow and/or reservoir storage for hydro units, energy storage capability for Energy Storage Resources, energy source variability and intermittency, mechanical limitations, and system operating policies. For this purpose, the basis for determining and demonstrating the capability of a particular generating unit is dependent upon the category (of the three generating unit types listed below) that describes the unit's attributes.
 - i. For generating units having the ability to maintain output at stated capability continuously on a daily basis without interruption, the capability of the generating unit is based on the level of output that the unit can provide under the site conditions expected to exist at the time of PJM system peak load where such conditions include, but are not limited to, ambient air temperature, humidity, barometric pressure, intake water temperature, and cooling system performance. Generating units with the ability to operate continuously across all hours of an operating day without interruption if needed include, but are not limited to, nuclear and fossil-fired steam units, combined cycle units, combustion turbine units, reciprocating engine units, and fuel cell units.
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