



PJM Interconnection, L.L.C.
2750 Monroe Boulevard
Audubon, PA 19403

Thomas S. DeVita
Associate General Counsel
T: (610) 635-3042 | F: (610) 666-8211
Thomas.DeVita@pjm.com

October 23, 2024

The Honorable Debbie-Anne A. Reese
Secretary
Federal Energy Regulatory Commission
888 First Street, N.E. Room 1A
Washington, D.C. 20426

**Re: *PJM Interconnection L.L.C., Docket No. ER22-962-00_*
Order No. 2222 Compliance Filing and Motion to Modify Effective Date of PJM
*Interconnection, L.L.C.***

Dear Secretary Reese,

In compliance with the Federal Energy Regulatory Commission’s (“FERC” or the “Commission”) July 25, 2024 Order¹ in the above-captioned Order No. 2222² compliance proceeding, PJM Interconnection, L.L.C. (“PJM”) hereby submits proposed revisions to the PJM Open Access Transmission Tariff (“Tariff”) and the Amended and Restated Operating Agreement of PJM Interconnection, L.L.C. (“Operating Agreement”).³

PJM is submitting the eTariff records contained herein with an effective date of February 2, 2026, to align with the effective date currently accepted by the Commission in this proceeding.

¹ *PJM Interconnection, L.L.C.*, 188 FERC ¶ 61,076 (2024) (the “July 25, 2024 Order”). *See also PJM Interconnection, L.L.C.*, Notice of Extension of Time, Docket No. ER22-962-005 (Aug. 8, 2024) (“Upon consideration, notice is hereby given that PJM’s motion for an extension of time to and including October 23, 2024, to submit its compliance filing as directed by the July 25 Order, is granted.”).

² *Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 172 FERC ¶ 61,247 (2020) (“Order No. 2222”); 174 FERC ¶ 61,197 (2021) (“Order No. 2222-A”); 175 FERC ¶ 61,227 (2021) (“Order No. 2222-B”).

³ The Tariff and Operating Agreement are currently located under PJM’s “Intra-PJM Tariffs” eTariff title, available here: <https://etariff.ferc.gov/TariffBrowser.aspx?tid=1731>. Terms not otherwise defined herein shall have the same meaning as set forth in the Tariff, Operating Agreement, and the Reliability Assurance Agreement among Load-Service Entities in the PJM Region (“RAA”).

However, as discussed below, PJM respectfully requests, pursuant to Rule 212,⁴ that the Commission permit an effective date of February 1, 2028 for the records currently designated in this proceeding with an effective date of February 2, 2026.

I. DESCRIPTION OF PROPOSED TARIFF AND OPERATING AGREEMENT REVISIONS.

For ease of reference, PJM has compiled into the following **Table 1** the individual compliance directives identified by the Commission in the July 25, 2024 Order, the specific Paragraph of the July 25, 2024 Order in which a given compliance directive is located, and the corresponding sections of the PJM Tariff and Operating Agreement that have been amended in response to each compliance directive. If applicable, PJM also identifies the applicable portion of this transmittal letter where further explanation is provided.

Table 1. Compliance Directives

Compliance Directive	Para.	Amended Tariff Sections or Applicable Transmittal Letter Sections
Specify that Component DER that participate in a net energy metering retail program may only participate with grid injections in the PJM ancillary services markets, and may not participate with injections in PJM’s energy or capacity markets.	44	Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b)
Establish any necessary information that must be submitted for the individual Component DER and identify[] and explain[] the proposed information requirements for the individual distributed energy resources.	92	Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b)
Further explain why [PJM’s] proposed metering requirement is just and reasonable and does not pose an unnecessary and undue barrier to individual distributed energy resources joining a distributed energy resource aggregation or propose	101	Transmittal Letter, section I.C; Tariff, Attachment K-Appendix, section 1.4B(e) and Operating Agreement, Schedule 1, section 1.4B(e)

⁴ 18 C.F.R. § 385.212.

Compliance Directive	Para.	Amended Tariff Sections or Applicable Transmittal Letter Sections
alternative tariff language that complies with this requirement of Order No. 2222.		
Explain[] why PJM’s proposal to trigger the 45-calendar day review on the DER Aggregator’s designation decision, as opposed to the EDC’s receipt of such designation, provides adequate and reasonable time for distribution utility review, consistent with Order No. 2222, or [] propose alternative tariff language that complies with this requirement of Order No. 2222.	129	Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b)
Clarify why [PJM’s] proposal is non-discriminatory and transparent, or alternatively revise the tariff language to require the EDC to communicate overrides to the DER Aggregator.	167	Tariff, Attachment K-Appendix, section 1.4B(f) and Operating Agreement, Schedule 1, section 1.4B(f)
Specify the financial obligations that will apply when a DER Aggregation Resource does not perform due to a utility override.	170	Tariff, Attachment K-Appendix, section 1.4B(f) and Operating Agreement, Schedule 1, section 1.4B(f)
Establish a process for ongoing coordination, including operational coordination, that addresses data flows and communication between PJM and the EDC.	171	Tariff, Attachment K-Appendix, section 1.4B(f) and Operating Agreement, Schedule 1, section 1.4B(f)

Descriptions of, and justification for, the proposed Tariff and Operating Agreement revisions addressing each compliance directive are provided in seriatim below, in the following subsections A-G.

A. ***Specify that Component DER that participate in a net energy metering retail program may only participate with grid injections in the PJM ancillary services markets, and may not participate with injections in PJM’s energy or capacity markets.***

i. *Commission Directive*

In the July 25, 2024 Order, the Commission directed further narrow refinements to PJM’s proposed tariff language excluding Component DER that are not participating in net energy

metering retail programs from providing injections in the PJM energy and capacity markets if they are located at a site where at least one other technology is participating in a net energy metering retail program, unless the Electric Distribution Company (“EDC”) and PJM determine during registration that their participation would not violate the restriction against double counting.⁵ Specifically, the Commission directed PJM to revise its tariff to specify that Component DER that participate in a net energy metering retail program may only participate with grid injections in the PJM ancillary services markets, and may not participate with injections in PJM’s energy or capacity markets.⁶

ii. PJM Compliance

In compliance with this directive, PJM proposes to modify its proposed language related to the double counting of Component DER that participate in a net energy metering retail program in Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b) in the identical manner as prescribed by the Commission.

Component DER that participate in a net energy metering retail program may only participate with grid injections in the PJM ancillary services markets, and may not participate with injections in PJM energy or capacity markets, unless[...]

PJM clarifies that Component DER that are enrolled in a net energy metering retail program may participate *with load reductions* in all PJM markets under the DER Aggregator Participation Model, so long as they otherwise meet all of the applicable participation requirements. Component DER enrolled in a net energy metering retail program may participate

⁵ July 25, 2024 Order at P 43.

⁶ *Id.* at P 44.

with injections in the ancillary services markets only. They may *not* participate *with injections* in PJM's capacity and energy markets.

B. Establish any necessary information that must be submitted for the individual Component DER and identify and explain the proposed information requirements for the individual distributed energy resources.

i. Commission Directive

In the July 25, 2024 Order, the Commission found that PJM did not comply with the Commission's prior directive to identify and explain the information requirements for Component DER in its tariff.⁷ Specifically, the Commission found that PJM's proposal to remove references in its tariff to all information and data requirements, and to instead describe such information in the relevant PJM Manuals, was not compliant for two reasons.

First, PJM does not identify and explain the information requirements that the Commission found ambiguous and unclear. Second, because PJM states that the DER Aggregator must provide information about each Component DER, and because the tariff does not state the information requirements, PJM fails to comply with the requirement of Order No. 2222 that each RTO/ISO "revise its tariff" to establish any necessary information that must be submitted for the individual distributed energy resources.⁸

Accordingly, the Commission directed PJM to establish any necessary information that must be submitted for the individual Component DER and identify and explain the proposed information requirements for the individual distributed energy resources.⁹

⁷ *Id.* at P 90.

⁸ *Id.* (footnotes omitted).

⁹ July 25, 2024 Order at P 92.

ii. PJM Compliance

In compliance with this directive, PJM proposes to modify Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b) to include specific categories of information that must be submitted for each Component DER during the registration process. PJM proposes to codify these specific categories of information in the text of the Tariff, with additional details reserved to the PJM Manuals. This approach is consistent with the Commission's guidance in the July 25, 2024 Order,¹⁰ and the manner in which such requirements are set for all other resources participating in PJM markets.¹¹

Accordingly, PJM proposes to revise Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b) in the following manner.

In order to participate in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model, a DER Aggregator shall register each DER Aggregation Resource and DER Capacity Aggregation Resource with the Office of the Interconnection, in accordance with the procedures established under the PJM Manuals. For each Component DER in a DER Aggregation Resource, the DER Aggregator shall provide:

- i. Identifying information, including the physical address and Electric Distribution Company account number;
- ii. Metering information, including meter type (e.g., Electric Distribution Company meter, other meter);
- iii. Capability information, including load reduction and injection capability.

¹⁰ July 25, 2025 Order at P 91 (“If the RTO/ISO needs information about the individual distributed energy resources, however, then the RTO/ISO must first establish those information requirements in its tariff. Further details regarding such information requirements may be included in the relevant PJM Manuals.” (footnote omitted)).

¹¹ See, e.g., Tariff, Attachment K-Appendix, section 8.4 (“1. Curtailment Service Providers must complete the applicable PJM Load Response Program Registration Form (“Registration Form”) that is posted on the PJM website (www.pjm.com) for each end-use customer, or aggregation of end-use customers, pursuant to the requirements set forth in the PJM Manuals.”).

PJM believes that these three categories encompass all of the information that will be necessary for an individual Component DER to successfully complete the registration process.

C. Further explain why [PJM's] proposed metering requirement is just and reasonable and does not pose an unnecessary and undue barrier to individual distributed energy resources joining a distributed energy resource aggregation or propose alternative tariff language that complies with this requirement of Order No. 2222.

i. Commission Directive

In the July 25, 2024 Order, the Commission found that PJM had not adequately explained why its proposed requirement that meter data be submitted to PJM within one business day was just and reasonable and does not pose an unnecessary and undue barrier to individual distributed energy resources joining a distributed energy resource aggregation.¹² As an example, the Commission noted that PJM had not addressed Joint Utilities' assertion that EDC meter data may not be readily available and, therefore, it may not be feasible for DER Aggregators in PJM to meet this deadline.¹³ Accordingly, the Commission directed PJM to “further explain why its proposed metering requirement is just and reasonable and does not pose an unnecessary and undue barrier to individual distributed energy resources joining a distributed energy resource aggregation or to propose alternative tariff language that complies with this requirement of Order No. 2222.”¹⁴

ii. PJM Compliance

In compliance with this directive, PJM further explains why the proposed one-day meter data submission requirement is necessary to: (1) accurately measure zonal load; (2) uphold parity

¹² July 25, 2024 Order at P 101.

¹³ *Id.*

¹⁴ *Id.*

between DER Aggregation Resources and all other generation resources participating in PJM's markets; and (3) maintain existing settlement timelines for all Market Participants.

The initial deadline for generator¹⁵ and tie line meter data submission is one business day following the operating day. This deadline is pivotal, since generator and tie line meter data submissions are used to calculate the real-time metered load within each fully metered EDC area.¹⁶ For the sake of simplicity, PJM will refer to this as “total zonal load” herein. This total zonal load value is then used by EDCs and Load Serving Entities (“LSEs”) to assign load responsibilities, and subsequently used by PJM in many downstream calculations involved in settling the energy and ancillary service markets. Therefore, both PJM and Market Participants have a strong interest in this value being as accurate as possible. The total zonal load is calculated as the sum of the net import energy flows reported for the revenue meters for the tie lines into the zone, plus the net generation within the zone reported by the generator revenue meters at the time of the one business day meter data submission deadline. If the total zonal load that is calculated immediately following the one business day meter data submission deadline does not include the meter data submissions of DER Aggregation Resources, the total zonal load used in downstream settlement calculations will be understated.

One downstream use of the total zonal load value is the calculation of the real-time load that each LSE is responsible for within the wholesale energy market. Once the total zonal load is calculated, the fully metered EDC, along with the LSEs in that territory, have until the following business day (e.g., the second business day after the operating day) to apportion that zonal load

¹⁵ The metering data required is respective of all resources capable of injecting power into the wholesale market.

¹⁶ For each EDC that reports hourly net energy flows from all metered tie lines to PJM via Power Meter and revenue meter data for the net energy delivered by all generators within that EDC's territory via Power Meter, the EDC is classified as a fully metered EDC for the purpose of energy market accounting.

out to each of the responsible LSEs. This, in turn, yields the real-time MWh load for which each LSE is responsible in the real-time energy market. If the total zonal load is inaccurate because it is missing the meter data submissions of the DER Aggregation Resources, then the real-time load assignments for the LSEs in the zone will be inaccurate as well. As a result, the real-time MWh load that the LSEs will be charged in the energy and ancillary service markets will be inaccurate.

Not only will the MWh of load assessed to each LSE be inaccurate, but the \$/MWh rates used across the various billing calculations that are allocated to real-time load will be inaccurate as well. This is because total zonal load is also an input into the Load Reconciliation Billing Determinant Rates¹⁷ used across various billing calculations. Without an accurate total zonal load, Market Participants do not have a rate reflective of the activity that occurred, which can result in cost shifting amongst participants. All things equal, absent the DER Aggregation Resources' injections, the rates for Spot Market Energy, Transmission Congestion, Inadvertent Energy, Reactive Services, Schedule 1A, Schedule 9-1, Schedule 9-3, Schedule 9-MMU, Schedule 9-OPSI, Schedule 9-CAPS, Regulation, Synchronized Reserve, Non-Synchronized Reserve, Secondary Reserve, amongst other line items which are billed based on real-time load MWh, will be higher on a \$/MWh basis for all participants.

Using a generic yet simplistic example to illustrate how cost shifting can occur, assume Regulation Charges are \$40,000 and total zonal load was 1,000 MWh. The Regulation Load Reconciliation Billing Determinant Rate is \$40/MWh ($\$40,000 / 1,000\text{MWh}$). An LSE with a metered real-time load of 70 MWh in a defined energy settlement area within that zone would owe

¹⁷ These are the \$/MWh rates charged to each MWh of real-time load. In general, they are calculated as the total charges to be allocated to load for the given market divided by the total real-time load in the area responsible for paying such charges.

\$2,800 ($\$40/\text{MWh} * 70 \text{ MWh}$).¹⁸ Now assume that 20 MWh of injections was missing from total zonal load during the initial submission process; the Regulation Load Reconciliation Billing Determinate Rate should have been $\$39.22/\text{MWh}$ ($\$40,000 / 1,020 \text{ MWh}$) which is a cost of $\$2,745.40$ ($\$39.22/\text{MWh} * 70 \text{ MWh}$) to the LSE. This results in the LSE paying an additional $\$54.60$ for the same 70 MWh purely due to the missing injections which would have increased the residual load in the zone. This can unjustly shift costs between the residual load served by providers of last resort (assuming they would bear the responsibility for the missing 20 MWh of load) and metered loads within defined energy settlement areas.

Given that the accuracy of total zonal load is a primary concern, some may suggest that PJM extend the one business day meter data submission deadline for *all* resources that inject into the system in order to provide DER Aggregation Resources with additional time to submit their meter data, without creating disparate treatment across injection resources. Such an extension, however, would not permit PJM to maintain its existing billing timelines. Specifically, the current timelines for issuance of PJM's month-to-date weekly billing statements is so compressed that an extension of meter data submissions is impracticable. The current Tariff requires a weekly bill be issued on Tuesday for the previous week's activity ending the prior Wednesday.¹⁹ For a typical week, that would mean Wednesday's injection meter data submissions would be submitted on Thursday and allocated as load on Friday. This leaves time for preparation of the bill on Monday so it may then be issued in a timely fashion on Tuesday. This timeline becomes further compressed

¹⁸ The real-time load MWh assigned to an LSE serving load in a defined, metered energy settlement area, such as a load within a municipality or co-op or an industrial load, would be unlikely to change if the total zonal load were increased by the addition of a DER Aggregation Resource Injection. Any increase to the total zonal load would instead be allocated to the LSE(s) acting as the provider of last resort that serves the residual load in the zone.

¹⁹ Tariff, section 7.1(b).

for a holiday schedule where PJM occasionally extends the meter data submission deadline by an additional calendar day. PJM's timeline for meeting the deadlines for issuing weekly month-to-date billing statements would be compromised without timely receipt of injection meter data submissions.

Others may suggest that PJM use estimated data for DER Aggregation Resources for the one business day meter data submission deadline and then true up the resource's injection MW through the month-end meter correction process. However, this approach also has shortcomings, which can shift costs amongst market participants. Participants that discover a meter error after the initial one business day deadline have until the last day of the following month to submit a correction. PJM's meter correction rules only accept corrections to the total monthly generation values. That is, the meter correction adjustments *are not tied to an individual hour or day*. Therefore, the correction is billed using the unit's real-time weighted average LMP for that month. As such, the correction does not result in a true financial re-settlement—settlement using five-minute real-time LMP when the generator was operating. Additionally, given the monthly nature of the corrections, the meter correction adjustments do not flow downstream into ancillary service billing. These adjustments are therefore not accounted for in the calculation of a resource's balancing operating reserve credits and deviation charges. Heavy reliance on the use of meter correction would not only impact the accuracy of the DER Aggregation Resource's billing, but also that of the counterparty to the meter correction. On the other sides of the meter correction transaction from generators is the EDC who will receive an equal and opposite charge for the correction. It then becomes the responsibility of the EDC to take the meter correction into account and assign the responsibility for this correction to the appropriate LSE during the load reconciliation process which occurs on a two-month lag. As mentioned previously, total zonal

load is set with the initial submissions and is not affected by meter corrections. Therefore, the total zonal load is static during the load reconciliation process. The purpose of the load reconciliation process is to make adjustments between LSEs to revise the share of the total zonal load that each party is responsible for. The EDC cannot simply add this additional load to total zonal load and could be left to pay for the DER Aggregation Resource's injections without a method to allocate them to the appropriate LSE. For example, assume a total zonal load of 1,000 MWh which was assigned to real-time load. If 20 MWh of injections are added during the Meter Correction process, the zonal load would remain unchanged at 1,000 MWh. The additional 20 MWh of load would be allocated directly to the EDC. The EDC, through the Load Reconciliation process, can (1) remove 20MWh from their account and assign it to the provider of last resort, (2) reallocate the load assignments throughout the zone on a percentage basis, or (3) leave the allocations as is and remain responsible for the additional 20 MWh. While the Meter Correction process is useful to address small metering errors, the above shortcomings illustrate why it should not be relied upon as a primary means of submitting revenue quality meter data for use in settling market activity.

Some may also argue that Demand Resources are not required to submit meter data at the one business day deadline and therefore DER Aggregation Resources should receive the same treatment. However, unlike DR participating in load management events, the MW injections coming from DER Aggregation Resources in the energy market cannot be easily segregated from the remaining generation activity. DR reductions can be segregated because they are not injections and are therefore not used in the calculation of the total real-time zonal load, which is explained above. Because DER Aggregation Resources inject power, their injection MWs need to be accounted for at the time of the one business day meter data submission deadline in order to support

accurate total zonal load calculations. As such, PJM believes that injections from DER Aggregation Resources should be treated in a manner consistent with all other injections into the grid.

The current one-day meter data submission is not an unnecessary and/or undue barrier—it is essential to ensuring the zonal real-time load values used to set load and billing rates are as accurate as possible given PJM’s current market rules, and ensuring that customers are accurately charged for the services provided to them under the just and reasonable Tariff and Operating Agreement mechanisms approved by the Commission. This rule also ensures that the costs and revenues of market activity are properly assigned to the responsible party, provides standardized and comparable treatment to all resources that inject energy into the wholesale market, and allows for timely financial closure of an operating day.

Finally, regarding the Joint Utilities concern that EDC meter data may not be readily available and, therefore, it may not be feasible for DER Aggregators in PJM to meet this deadline, PJM clarifies that, while a DER Aggregator may use meter data from EDC meters to settle a DER Aggregation Resource if that data is available, they are not *required* to do so. The DER Aggregator is the sole party responsible for meeting the metering requirement for participation in the DER Aggregator Participation Model. The DER Aggregator may use their own metering configuration as long as it meets the tariff-defined accuracy requirements. Some DR providers use their own metering equipment today which meets the tariff-defined accuracy requirements, especially for participation in the ancillary service markets that require more granular meter data.

For all of the reasons described herein, the proposed one business day meter data submission deadline is necessary, just and reasonable, and does not pose an undue barrier to Component DER wishing to join a DER Aggregation Resource.

Beyond the settlement deadline, stakeholder conversations revealed that there exists a lack of clarity regarding the entity that is responsible for submitting meter data to PJM. To that end, PJM clarifies that the responsibility to ensure that adequate metering equipment exists at a Component DER site—metering that meets the accuracy requirements established in Tariff, Attachment K-Appendix, section 1.4B(e) and Operating Agreement, Schedule 1, section 1.4B(e)—and that meter data is timely submitted to PJM for settlement, rests solely with the DER Aggregator, as the market participant, and *not* with the EDC. Accordingly, PJM proposes to revise Tariff, Attachment K-Appendix, section 1.4B(e) and Operating Agreement, Schedule 1, section 1.4B(e) in the following manner. In addition to clarifying that the DER Aggregator is the entity responsible for submitting meter data for settlement, the proposed revisions also remove duplicative references to PJM’s accuracy requirements.

Meter data shall be submitted by the DER Aggregator to the Office of Interconnection within one business day. ~~The measurement systems shall comply with the applicable Electric Distribution Company accuracy requirements for meters, and/or as described in the PJM Manual 01. Additional details for the configuration of such measurement systems under various specific configurations are specified in PJM Manual 14D.~~

The DER Aggregator shall ensure that the metering equipment for settlement ~~shall meet the Electric Distribution Company requirements for accuracy, or otherwise have~~ has a maximum error of two percent over the full range of the metering equipment (including potential transformers and current transformers) and the metering equipment, metering configurations, and associated data ~~shall~~ meets the requirements set forth herein and in the PJM Manuals.

D. Explain why PJM’s proposal to trigger the 45-calendar day review on the DER Aggregator’s designation decision, as opposed to the EDC’s receipt of such designation, provides adequate and reasonable time for distribution utility review, consistent with Order No. 2222, or propose alternative tariff language that complies with this requirement of Order No. 2222.

i. Commission Directive

In the July 25, 2024 Order, the Commission found that PJM’s proposed tariff was not clear with respect to the timing of the commencement of the EDC’s 45-calendar day review.²⁰ The Commission noted that, under PJM’s proposed tariff language, the 45-calendar day review period commences “upon such designation by the DER Aggregator,” which could allow the 45-calendar day review period to commence before the EDC receives the designation. The Commission found that this triggering event is in contrast to the 15-calendar day review period, which “commence[s] upon receipt by the [EDC] of notice from PJM.”

Accordingly, the Commission directed PJM to explain “why PJM’s proposal to trigger the 45-calendar day review on the DER Aggregator’s designation decision, as opposed to the EDC’s receipt of such designation, provides adequate and reasonable time for distribution utility review, consistent with Order No. 2222,” or propose “alternative tariff language that complies with this requirement of Order No. 2222.”²¹

ii. PJM Compliance

In compliance with this directive, PJM proposes to revise Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b) to trigger the 45-calendar day review period on the EDC’s receipt of notification of the designation of a DER Aggregation Resource, rather than the designation itself. PJM clarifies that it expects the “designation” of the

²⁰ *Id.* at P 129.

²¹ *Id.*

DER Aggregation Resource and the EDC’s “receipt” of such designation to happen simultaneously—i.e., the EDC will be notified immediately upon such designation within the platform that PJM will develop to manage DER Aggregation Resources. As such, PJM treated “designation” and “receipt of notification” as synonymous triggers. That said, in order to provide absolute clarity regarding the language’s intent, as well as maintain consistency with the trigger for the first 15-day review, PJM proposes to revise Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b) in the following manner.

The second forty-five calendar day review period shall commence upon receipt by the Electric Distribution Company of notification of such designation by the DER Aggregator from the Office of the Interconnection, whereby the Electric Distribution Company shall review the DER Aggregation Resource and verify that the participation of the DER Aggregation Resource Component DER in the PJM energy, capacity, and/or ancillary service markets does not pose a threat to the reliable and safe operation of the distribution system, the public, or Electric Distribution Company personnel.

Finally, PJM clarifies that, for both the first 15-day review of the Component DER and the second 45-day reliability review of the DER Aggregation Resource, “receipt of notification” is equivalent to the time at which the applicable review item appears in the applicable PJM Tool and is accessible for the EDC review, *not* the time at which an EDC representative views the notification.²² PJM will also not require any acknowledgement of such receipt. This process is consistent with the review trigger timelines and processes for demand response resources participating in PJM markets today.

²² PJM expects to also implement an optional email notification which can be configured for each user.

E. Clarify why PJM’s proposal is non-discriminatory and transparent, or alternatively revise the tariff language to require the EDC to communicate overrides to the DER Aggregator.

i. Commission Directive

In the July 25, 2024 Order, the Commission found that PJM’s proposed tariff language provides the circumstances under which an EDC may exercise its ability to override the physical operation of a DER Aggregation Resource, the process by which such decision is communicated to the DER Aggregator, and the action that the DER Aggregator must take to reflect that override, i.e., updating the applicable bidding parameters.²³ The Commission also found that PJM’s tariff language clarifies that PJM’s role is to re-dispatch the DER Aggregation Resource to reflect those updated bidding parameters, and not to interfere with the EDC’s override decision.²⁴

However, the Commission noted that while PJM stated in its transmittal that “the decision to override PJM dispatch should be communicated by the Electric Distribution Company directly to the DER Aggregator as soon as practicable,” the proposed tariff language stated only that the EDC “may communicate” the override decision to the DER Aggregator. The Commission directed PJM to clarify why PJM’s proposed tariff language regarding communication of EDC overrides is non-discriminatory and transparent, or alternatively revise the tariff language to require the EDC to communicate overrides to the DER Aggregator.²⁵

ii. PJM Compliance

In compliance with this directive, PJM clarifies that it expects all override decisions of individual Component DER and/or DER Aggregation Resources by the EDC to be communicated

²³ July 25, 2024 Order at P 167.

²⁴ *Id.*

²⁵ *Id.*

to the DER Aggregator as soon as practicable. Moreover, the override decision should be communicated by the EDC *directly* to the DER Aggregator such that the DER Aggregator is able to reflect the override by updating the applicable bidding parameters. However, because the EDC is not a wholesale market participant in this instance, and is presumably excluded from the Commission's general rate and transmission jurisdiction under Federal Power Act ("FPA") section 201,²⁶ PJM does not believe that it is able to *mandate*, in its Tariff, that the EDC take or not take specific actions with respect to the communication of overrides.²⁷ To better communicate this intent, PJM proposes to revise Tariff, Attachment K-Appendix, section 1.4B(f) and Operating Agreement, Schedule 1, section 1.4B(f) as follows.

The Electric Distribution Company ~~should~~ ~~may~~ communicate the decision to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource directly to the DER Aggregator.

PJM will work with stakeholders to identify whether there exists an opportunity to facilitate the communication of the override decision between the EDC and the DER Aggregator, or maintain a record of such decisions, under existing tools and processes without complicating or creating additional operational risk regarding the direct communication channel between the EDC and DER Aggregator.

²⁶ 16 U.S.C. § 824(b)(1) ("The Commission shall have jurisdiction over all facilities for such transmission or sale of electric energy, but shall not have jurisdiction, except as specifically provided in this subchapter and subchapter III of this chapter, over facilities used for the generation of electric energy or over facilities used in local distribution or only for the transmission of electric energy in intrastate commerce, or over facilities for the transmission of electric energy consumed wholly by the transmitter.").

²⁷ To the extent that the Commission believes that EDCs can be directly subject to PJM Tariff requirements within the context of FPA section 201, PJM respectfully requests that the Commission provide guidance in its order on this compliance filing.

F. Specify the financial obligations that will apply when a DER Aggregation Resource does not perform due to a utility override.

i. Commission Directive

In the July 25, 2024 Order, the Commission found that PJM had partially complied with the Commission’s prior directive to revise its tariff to specify the existing resource non-performance penalties that will apply to a distributed energy resource aggregation when the aggregation does not perform because a distribution utility overrides RTO/ISO dispatch.²⁸ The Commission found that PJM’s proposed tariff language stating that “[a]n [EDC’s] override shall not excuse a DER Aggregator from any financial obligations under the PJM Governing Agreements....” lacked specificity regarding the financial obligations that would apply to a DER Aggregator when an EDC overrides PJM’s dispatch.²⁹

Accordingly, the Commission directed PJM to specify in its tariff language the financial obligations that will apply when a DER Aggregation Resource does not perform due to a utility override.

ii. PJM Compliance

In compliance with this directive, PJM proposes to modify the proposed language in Tariff, Attachment K-Appendix, section 1.4B(f) and Operating Agreement, Schedule 1, section 1.4B(f) in the manner proposed below. The revised language specifically identifies the applicable Tariff and Operating Agreement Attachments where these financial obligations are located, and illustrates the financial obligations that would apply to a DER Aggregator in the event of underperformance due to an EDC override of PJM’s dispatch.

²⁸ July 25, 2024 Order at P 170.

²⁹ *Id.*

An Electric Distribution Company's override shall not excuse a DER Aggregator from any financial obligations for failure to perform under ~~the PJM Governing Agreements for failure to perform any of the obligations established under the PJM Governing Agreements or PJM Manuals for the relevant PJM capacity, energy, and/or ancillary services markets~~ Tariff, Attachment K-Appendix, Operating Agreement, Schedule 1, or Tariff, Attachment DD, including balancing Operating Reserve and other performance charges, and capacity resource non-performance and test failure charges.

G. *Establish a process for ongoing coordination, including operational coordination, that addresses data flows and communication between PJM and the EDC.*

i. Commission Directive

In the July 25, 2024 Order, the Commission found that PJM's statement that PJM and the EDC will maintain informal communications does not comply with the Commission's prior directive regarding coordination between PJM and the distribution utility.³⁰ The Commission noted that Order No. 2222 requires a process in the tariff for communication between the RTO/ISO and the distribution utility.³¹

Accordingly, the Commission directed PJM to revise its tariff to establish a process for ongoing coordination, including operational coordination, that addresses data flows and communication between PJM and the EDC.³²

ii. PJM Compliance

In compliance with this directive, PJM proposes to modify Tariff, Attachment K-Appendix, section 1.4B(f) and Operating Agreement, Schedule 1, section 1.4B(f) to establish

³⁰ *Id.* at P 171.

³¹ *Id.*

³² *Id.*

communication between PJM and the EDC with respect to the sharing of market results for the DER Aggregation Resources in the EDC's territory. Specifically, PJM believes that having visibility into the day-ahead market schedules will assist the EDC in determining whether and when an override of a specific DER Aggregation Resource is warranted.

Accordingly, PJM proposes to revise Tariff, Attachment K-Appendix, section 1.4B(f) and Operating Agreement, Schedule 1, section 1.4B(f) in the following manner.

During the Operating Day, the Office of the Interconnection shall dispatch the DER Aggregation Resource, in accordance with the DER Aggregator's submitted bidding parameters. The Office of the Interconnection shall make available to the Electric Distribution Company the cleared Day-ahead Energy Market schedules for the DER Aggregation Resources in their territory.

II. EFFECTIVE DATE

As referenced above, PJM is submitting the eTariff records contained herein with an effective date of February 2, 2026, to align with the effective date currently accepted by the Commission in this proceeding.

III. MOTION TO MODIFY EFFECTIVE DATE

PJM respectfully requests pursuant to Rule 212³³ that the Commission permit an effective date of February 1, 2028 for the eTariff records currently designated in this proceeding with an effective date of February 2, 2026. This would functionally move the implementation of the DER Aggregator Participation Model forward two years from the date currently contemplated in this proceeding.

PJM submits that good cause exists to grant this requested extension of the effective date for PJM's Order No. 2222 compliance implementation. In PJM's March 31, 2023 Informational

³³ 18 C.F.R. § 385.212.

Update Regarding Effective Date Implementation,³⁴ PJM explained that it “will need to pursue a number of major software and application upgrades to effectuate full implementation, in light of the scale of Order No. 2222.” These include:

1. Modifications to Markets Gateway³⁵ to develop new screens within the application, so that DER Aggregation Resources can effectively offer into PJM’s markets and accurately represent their parameters.
2. Creation of the software tool necessary to facilitate the DER Aggregator Participation Model, which will be used as the central hub for coordination and communication between PJM, the DER Aggregator, and the applicable distribution utility.
3. Modifications to PJM’s day-ahead and real-time market engines to effectuate the DER Aggregator Participation Model and the implementing applicable business rules.
4. Implementation of a new modeling structure for Component DER, to facilitate locational mapping of the resources, while protecting the integrity of system performance.
5. Modification of the markets settlement systems and underlying supporting databases so that PJM can properly uphold the Commission’s directives regarding aggregate settlements, Order No. 745 rules, and double-counting.

PJM further explained that, “based on PJM’s internal assessment, in order to successfully implement these changes by February 2, 2026, two primary conditions would be required.”³⁶

First, PJM would need an order from the Commission approving the majority of PJM’s major outstanding compliance directives, as specified by the March 1, 2023 Order, by the end of 2023. This would allow twenty-four months for development, testing, implementation, and meeting PJM’s compliance obligations under Order No. 760.³⁷ Second, PJM’s final compliance order would not

³⁴ *PJM Interconnection, L.L.C.*, Informational Filing of PJM Interconnection, L.L.C., Docket No. ER22-962-001, at 3 (Mar. 31, 2023) (“Informational Update Regarding Effective Date Implementation”).

³⁵ In PJM, Market Sellers may submit offers into the Day-ahead Energy Market and the Real-time Energy Market through a user interface portal called Markets Gateway. Among other things, Markets Gateway allows each Market Seller to input numerical values for corresponding offer components.

³⁶ Informational Update Regarding Effective Date Implementation at 4.

³⁷ *Enhancement of Electricity Market Surveillance and Analysis through Ongoing Electronic Delivery of Data from Regional Transmission Organizations and Independent System Operators*, 139 FERC ¶ 61,053 (2012) (“Order No.

require radically divergent market design elements than what PJM had originally contemplated in its February 1, 2022 Compliance Filing, such as a multi-nodal framework for energy market participation and the development of associated distribution factors. These new elements would require additional time to implement than what had been originally contemplated on February 1, 2022.³⁸

PJM has subsequently indicated in this and related dockets that the date of February 2, 2026 may need to be advanced to account for the date of the Commission's rulings on PJM's compliance proposals, and the corresponding resolution of regulatory uncertainty regarding major components of PJM's Order No. 2222 compliance approach.³⁹

Accounting for the date of the July 25, 2024 Order, and the corresponding resolution of regulatory uncertainty regarding major components of PJM's Order No. 2222 compliance proposal, PJM now estimates that February 1, 2028, is feasible to successfully implement the

760"). *See, e.g.*, Order No. 760 at P 40 ("Finally, to allow the Commission to stay abreast of any change in how data described in this final rule is collected, we direct each RTO and ISO to notify Commission staff in writing of any such change, 90 days prior to such a change or as soon as practicable once such a change is known. Such a change may necessitate the submission of updated documentation. Notifications of forthcoming changes, and updated documentation when appropriate, will allow the Commission to anticipate and make necessary adjustments to its own management and storage of RTO and ISO data, especially given that the data will not be received in a single consistent format across the RTOs and ISOs.").

³⁸ Informational Update Regarding Effective Date Implementation at 4.

³⁹ *See, e.g., PJM Interconnection, L.L.C., Compliance Filing of PJM Interconnection, L.L.C., Docket No. ER22-962-004, at 6-7 (June 14, 2023)* ("Nonetheless, there is uncertainty about PJM's ability to have an operable DER Aggregator Participation Model by February 2026. The scope of the changes required to comply with the March 1, 2023 Order, including a number of fundamental aspects of PJM's approach, reasonably prevent PJM from beginning to develop the software changes. Accordingly, as PJM has explained, successful implementation requires at least 24 months from a Commission order approving most of the major outstanding compliance directives to develop, test, and implement the approach, and any Commission directive that radically diverges from the current-contemplated market design would lengthen (maybe significantly) the implementation timeframe." (footnote omitted)); *PJM Interconnection, L.L.C., Filing to Implement Capacity Market Rules Applicable to DER Capacity Aggregation Resources Under Order No. 2222 of PJM Interconnection, L.L.C., Docket No. ER24-1803-000, at 7 (Apr. 22, 2024)* ("Finally, PJM notes that in its March 31, 2023 Informational Update Regarding Effective Date Implementation, PJM described at length the work it anticipated to be necessary to effectuate the February 2, 2026 implementation date of its Order No. 2222 participation model, and described certain conditions that PJM believed would be necessary to realize that specific 'go-live' date . . . While PJM is not seeking to extend the current February 2, 2026 effective date of the Order No. 2222 participation model in this FPA section 205 filing, it may do so in a future submission.").

compliance approach affirmed in the July 25, 2024 Order, including the major software and application upgrades referenced above, development, testing, and documentation necessary to meet PJM’s compliance obligations under Order No. 760. Accordingly, PJM respectfully requests that the Commission grant this effective date for the following Tariff, Operating Agreement, and RAA records that have been accepted in this proceeding with a February 2, 2026 effective date.

Table 2. Tariff, Operating Agreement, and RAA Records Effective February 2, 2026

Intra-PJM Tariffs - Tariff, Operating Agreement, RAA	Version	Date Filed	Docket No.
Tariff, Definitions – A - B	17.0.0	2/1/2022	ER22-962-000
Tariff, Definitions – C-D	31.0.0	2/1/2022	ER22-962-000
Tariff, Definitions – E - F	36.0.0	9/1/2023	ER22-962-005
Tariff, Attachment K – Appendix, section 1.2	2.0.0	2/1/2022	ER22-962-000
Tariff, Attachment K – Appendix, section 1.4B	0.0.0	2/1/2022	ER22-962-000
Tariff, Attachment K – Appendix, section 1.4B	0.1.0	3/31/2023	ER22-962-002
Tariff, Attachment K – Appendix, section 1.4B	0.3.0	9/1/2023	ER22-962-005
Tariff, Attachment K – Appendix, section 1.10	42.0.0	2/1/2022	ER22-962-000
Tariff, Attachment K – Appendix, section 3.3A	14.0.0	2/1/2022	ER22-962-000
Tariff, Attachment K – Appendix, section 6.4	14.0.0	2/1/2022	ER22-962-000
Tariff, Attachment N-4	0.0.0	2/1/2022	ER22-962-000
Tariff, Attachment DD, section 5.14	33.0.0	2/1/2022	ER22-962-000
Tariff, Attachment DD, section 6.6A	1.0.0	2/1/2022	ER22-962-000
Tariff, Attachment DD, section 10A	10.0.0	2/1/2022	ER22-962-000
Tariff, Attachment DD, section 11B	0.0.0	2/1/2022	ER22-962-000
Operating Agreement, Schedule 1 - Section 1.2	2.0.0	2/1/2022	ER22-962-000
Operating Agreement, Schedule 1 - Section 1.4B	0.0.0	2/1/2022	ER22-962-000
Operating Agreement, Schedule 1 - Section 1.4B	0.1.0	3/31/2023	ER22-962-002
Operating Agreement, Schedule 1 - Section 1.4B	0.3.0	9/1/2023	ER22-962-005
Operating Agreement, Schedule 1 - Section 1.10	42.0.0	2/1/2022	ER22-962-000
Operating Agreement, Schedule 1 - Section 3.3A	14.0.0	2/1/2022	ER22-962-000
Operating Agreement, Schedule 1 - Section 6.4	14.0.0	2/1/2022	ER22-962-000
RAA ARTICLE 1 -- DEFINITIONS	37.1.0	2/1/2022	ER22-962-000
RAA SCHEDULE 9.1	1.0.0	2/1/2022	ER22-962-000

PJM is submitting this motion in this compliance docket (ER22-962) in light of the Commission’s guidance in its November 13, 2023 Order.⁴⁰ If the Commission grants this motion, PJM will

⁴⁰ *PJM Interconnection, L.L.C.*, 185 FERC ¶ 61,112, at P 29 (2023) (the “November 13, 2023 Order”) (“In light of PJM’s concerns about potential delay in the implementation of the DER Aggregator Participation Model by February 2, 2026, and given our concerns above about an indefinite effective date, we note that PJM may submit a motion requesting an extension for the February 2, 2026 Order No. 2222 compliance tariff provisions that accounts for PJM’s

submit the appropriately re-dated eTariff records to memorialize the new effective date of February 1, 2028.

IV. CORRESPONDENCE AND COMMUNICATIONS

Please direct any communications regarding this filing to the following individuals:

Thomas DeVita
Associate General Counsel
PJM Interconnection, L.L.C.
2750 Monroe Boulevard
Audubon, PA 19403
(610) 635-3042
Thomas.DeVita@pjm.com

Craig Glazer
Vice President – Federal Government Policy
PJM Interconnection, L.L.C.
1200 G Street, N.W.
Suite 600
Washington, D.C. 20005
(202) 423-4743
Craig.Glazer@pjm.com

V. DOCUMENTS INCLUDED WITH THIS FILING

In accordance with the requirements of Order No. 714⁴¹ and the Commission's eTariff regulations, PJM hereby submits an eTariff XML filing package consisting of the following materials:

1. This transmittal letter;
3. Attachment A – Revisions to the Tariff and Operating Agreement, effective February 2, 2026, in redlined format; and
3. Attachment B – Revisions to the Tariff and Operating Agreement, effective February 2, 2026, in clean format.

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

ability to develop and implement necessary software changes in advance of DER Aggregation Resources participating in its markets.”).

⁴¹ *Electronic Tariff Filings*, Order No. 714, 124 FERC ¶ 61,270 (2008), *final rule*, Order No. 714-A, 147 FERC ¶ 61,115 (2014).

Commission's regulations,⁴² PJM will post a copy of this filing to the FERC filings section of its internet site, located at the following link: <https://www.pjm.com/library/filing-order> 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 Region⁴³ alerting them that this filing has been made by PJM today and is available by following such link. If the document is not immediately available by using the referenced link, the document will be available through the referenced link within 24 hours of the filing. Also, a copy of this filing will be available on the FERC's eLibrary website located at the following link: <http://www.ferc.gov/docs-filing/elibrary.asp> in accordance with the Commission's regulations and Order No. 714. PJM also served this filing on each person designated on the official service list maintained by the Commission for this proceeding.

⁴² See 18 C.F.R. §§ 35.2(e) and 385.2010(f)(3).

⁴³ PJM already maintains, updates, and regularly uses e-mail lists for all PJM members and affected commissions.

VII. CONCLUSION

In accordance with the foregoing, PJM respectfully requests that the Commission accept this submission and associated tariff records, as discussed herein.

Respectfully submitted,

Craig A. Glazer
Vice President – Federal Government Policy
PJM Interconnection, L.L.C.
1200 G Street, N.W.
Suite 600
Washington, D.C. 20005
(202) 423-4743
Craig.Glazer@pjm.com

/s/ Thomas DeVita
Thomas S. DeVita
Associate General Counsel
PJM Interconnection, L.L.C.
2750 Monroe Boulevard
Audubon, PA 19403
(610) 635-3042
Thomas.DeVita@pjm.com

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

October 23, 2024

CERTIFICATE OF SERVICE

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

Dated at Audubon, PA this 23rd day of October, 2024.

/s/ Thomas DeVita

Thomas S. DeVita

Associate General Counsel

PJM Interconnection, L.L.C.

Attachment A

Revisions to the PJM Open Access Transmission Tariff and Operating Agreement

(Identified by Additional Cover Pages)

(Marked/Redline Format)

PJM Open Access Transmission Tariff
Attachment K-Appendix, section 1.4B

1.4B DER Aggregator Participation Model

(a) The rules and procedures for the participation of DER Aggregators are established pursuant to this section 1.4B and the PJM Manuals.

(b) In order to participate in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model, a DER Aggregator shall register each DER Aggregation Resource and DER Capacity Aggregation Resource with the Office of the Interconnection, in accordance with the procedures established under the PJM Manuals. For each Component DER in a DER Aggregation Resource, the DER Aggregator shall provide:

i. Identifying information, including the physical address and Electric Distribution Company account number;

ii. Metering information, including meter type (e.g., Electric Distribution Company meter, other meter);

iii. Capability information, including load reduction and injection capability.

The Electric Distribution Company review portion of the registration process shall commence after: (1) the Office of the Interconnection has an executed DER Aggregator Participation Service Agreement on file, to be used for all DER Aggregation Resources associated with the DER Aggregator; and (2) the Office of the Interconnection receives a complete registration from the DER Aggregator, in a form specified in the PJM Manuals.

Upon receipt of a DER Aggregator's completed registration, the Office of the Interconnection shall review the registration and data submitted therein for completeness, and verify that the DER Aggregator meets the eligibility criteria for participation in the DER Aggregator Participation Model, as defined under the PJM Tariff and Operating Agreement and Manuals. The DER Aggregator shall only submit a registration for Component DER that are under contract for the term of the registration, and only one DER Aggregator may operate Component DER at a specific location. The Office of the Interconnection shall notify the appropriate Electric Distribution Company of the DER Aggregator's registration through the appropriate PJM system. A single registration shall only be comprised of individual Component DER in the same state, Electric Distribution Company, Transmission Zone, and pricing point unless otherwise noted below.

The Electric Distribution Company review process shall consist of two periods, in sum not to exceed sixty calendar days. The first shall be a single period, not to exceed fifteen calendar days, during which time the Electric Distribution Company and the Office of the Interconnection shall review and verify each Component DER for which a location was created. The second shall be a single period, not to exceed forty-five calendar days, during which the Electric Distribution Company shall perform a reliability review of the DER Aggregation Resource. In the event that the last day of either the fifteen or forty-five calendar day review period falls on a weekend or holiday, the review period shall conclude on the next business day.

The first fifteen calendar day review period shall commence upon receipt by the Electric Distribution Company of notification from the Office of the Interconnection. Following notification, the Electric Distribution Company may review and verify, as applicable, the Component DER for which a location was created and the following information associated therewith:

- i. The location and data components that represents each Component DER, as further defined in the relevant PJM Manuals, are accurate;
- ii. Participation of the Component DER in an Electric Distribution Company's retail program at the time of registration does not preclude participation of the Component DER in the energy, capacity, and/or ancillary services markets of PJM, and as defined in the PJM Manuals;
 - a. Component DER that participate in a net energy metering retail program may only participate with grid injections in the PJM ancillary services markets, and may not participate with injections in PJM energy or capacity markets, unless:
 1. the Electric Distribution Company confirms to the Office of the Interconnection that participation of the Component DER in a net energy metering retail program or tariff approved by the Relevant Electric Retail Regulatory Authority will not violate the restrictions on duplicative compensation, as described in Tariff, Attachment K-Appendix, section 1.4B(h) and Operating Agreement, Schedule 1, section 1.4B(h); and
 2. the Office of the Interconnection determines that the participation of the Component DER otherwise meets the applicable requirements for energy market or capacity market participation.
 - b. Component DER that participate in a net energy metering retail program that also participate with grid injections in the PJM ancillary services markets shall, based on the information provided by the DER Aggregator or the Electric Distribution Company, be excluded from PJM energy market settlements.
- iii. The Component DER complies with the rules and regulations of any applicable Relevant Electric Retail Regulatory Authority;
- iv. The Relevant Electric Retail Regulatory Authority allows the participation of any applicable Component DER that are also end-use customers of an Electric Distribution Company, in accordance with the provisions of Tariff, Attachment K-Appendix, section 1.4B(g), and Operating Agreement, Schedule 1, section 1.4B(g).

Within the first fifteen calendar day review period, and in coordination with the Office of Interconnection, the Electric Distribution Company shall also assign the electrical node on the PJM Transmission System to each Component DER. The Office of the Interconnection shall ensure that any information regarding Component DER that the Office of the Interconnection receives from an Electric Distribution Company or a DER Aggregator is accessible to both the Electric Distribution Company and the DER Aggregator.

Following approval of the Component DER by the Electric Distribution Company and the Office of the Interconnection, the DER Aggregator shall designate DER Aggregation Resources comprising of one or more of the approved Component DER. The second forty-five calendar day review period shall commence upon [receipt by the Electric Distribution Company of notification of](#) such designation by the DER Aggregator, [from the Office of the Interconnection](#) whereby the Electric Distribution Company shall review the DER Aggregation Resource and verify that the participation of the DER Aggregation Resource in the PJM energy, capacity, and/or ancillary service markets does not pose a threat to the reliable and safe operation of the distribution system, the public, or Electric Distribution Company personnel. The scope of the Electric Distribution Company review of distribution system reliability impacts shall be limited to any incremental impacts arising from a Component DER participation in a DER Aggregation Resource that were not previously considered by the Electric Distribution Company during the interconnection study process for that Component DER.

If the Electric Distribution Company identifies concerns during the Electric Distribution Company review portion of the registration process, the Electric Distribution Company may notify the Office of the Interconnection and the DER Aggregator, and the Electric Distribution Company and the DER Aggregator may first attempt to resolve those concerns bilaterally, or in accordance with applicable state or local law, prior to seeking initiation of the dispute resolution process described in Operating Agreement, Schedule 5. Issues within disputes that the Office of the Interconnection determines solely concern the application of any applicable tariffs, agreements, and operating procedures of the Electric Distribution Company, and/or the rules and regulations of any Relevant Electric Retail Regulatory Authority, shall be addressed in accordance with applicable state or local law, and shall not be arbitrated or in any way resolved by the Office of the Interconnection or through the dispute resolution processes under Operating Agreement, Schedule 5. Issues within disputes that the Office of the Interconnection determines concern the provisions of the PJM Governing Agreements may be arbitrated under the dispute resolution processes under Operating Agreement, Schedule 5.

In the event that the Electric Distribution Company's concerns are resolved within the Electric Distribution Company review portion of the registration process, the Electric Distribution Company may recommend that the Office of the Interconnection approve the location and/or registration, as applicable. In the event that the concerns identified by the Electric Distribution Company are not resolved, the Electric Distribution Company may, within the Electric Distribution Company review portion of the registration process, recommend that the Office of the Interconnection: (i) reject the location and/or registration, (ii) approve the registration with certain operational limitations on the DER Aggregation Resource identified in the registration, or

(iii) approve the registration with the removal of one or more specific Component DER from the DER Aggregation Resource identified in the registration.

Following the Electric Distribution Company's review of the DER Aggregation Resource registration, within fifteen calendar days, the Office of the Interconnection shall apply the applicable pricing points to the DER Aggregation Resource, and shall either approve or deny the DER Aggregator's registration based on the Office of the Interconnection's review of the registration and receipt and review of the Electric Distribution Company's comments and recommendation, with deference given to the Electric Distribution Company's assessment of the impact of the DER Aggregator's registration on the safety and reliability of distribution facilities. To the extent that no comments or recommendations are provided by the Electric Distribution Company, including after the Office of the Interconnection provides final notice to the Electric Distribution Company prior to the expiration of the Electric Distribution Company review portion of the registration process, the Office of the Interconnection shall approve the DER Aggregator's registration.

All DER Aggregators shall remain in full compliance with the tariffs, agreements, and operating procedures of the applicable Electric Distribution Company, and the rules and regulations of any Relevant Electric Retail Regulatory Authority, in accordance with their executed DER Aggregator Participation Service Agreement, at all times while participating in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model.

Transmission Owners shall, in coordination with the Office of the Interconnection, provide all data to the Office of the Interconnection reasonably required to accurately represent the DER Aggregation Resource in the Regional Transmission Expansion Plan, in accordance with Operating Agreement, section 1.5.4 and the PJM Manuals.

A DER Aggregator shall report to the Office of the Interconnection any proposed update to the inventory of the individual Component DER within the DER Aggregation Resource, or proposed additional market services provided by the DER Aggregation Resource, identified in the DER Aggregator's registration to reflect any proposed addition or subtraction of a Component DER or market service, and any applicable information or data associated with the Component DER or market service, in accordance with the specifications described in the PJM Manuals. Any proposed update shall not require a new registration of the existing Component DER within the approved DER Aggregation Resource. Upon the Electric Distribution Company's receipt of notification of any proposed update, including all applicable information or data, the host Electric Distribution Company shall have an opportunity to conduct a review, for the first fifteen calendar day and/or second forty-five calendar day review period, in accordance with the provisions of this section related to initial registration, and make a recommendation to the Office of the Interconnection, prior to the Office of the Interconnection approving or denying the proposed update to the DER Aggregation Resource. The DER Aggregator may continue to participate in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model using its existing approved DER Aggregation Resource during the course of any such review conducted by the Electric Distribution Company. An inventory of the individual Component DER within a DER Aggregation Resource registration that is linked to

a DER Capacity Aggregation Resource may not be modified during the course of an applicable Delivery Year.

(c) All Component DER in a DER Aggregation Resource shall interface with the same primary pricing node, except: (i) in the case of a DER Aggregation Resource that only provides ancillary services and is less than or equal to 5 MW, the Component DER within the DER Aggregation Resource may interface with multiple primary pricing nodes, so long as those primary pricing nodes are in the same state, service territory of a single Electric Distribution Company and Transmission Zone; and (ii) in the case of a DER Aggregation Resource utilizing the limited multi-nodal aggregation participation option described below, so long as those primary pricing nodes are in the same state, service territory of a single Electric Distribution Company and Transmission Zone, and meet the criteria defined below and in the PJM Manuals; and (iii) in the case of a DER Capacity Aggregation Resource, the Component DER within a DER Aggregation Resource(s) linked to the DER Capacity Aggregation Resource may interface with multiple primary pricing nodes, so long as those primary pricing nodes are located within a defined zone or sub-zonal Locational Deliverability Area.

The purpose of participating under the limited multi-nodal aggregation option is to allow the participation of Component DER in the energy market that cannot form aggregations at a single primary pricing node at the minimum capability criteria of 0.1 MW. To participate, the multi-nodal DER Aggregation Resource may be comprised of one or more Component DER with capability smaller than 0.1 MW. Component DER at a single primary node with capability greater than 0.1 MW shall be excluded from participation in the multi-nodal DER Aggregation Resource unless the total capability of all other Component DER in a DER Aggregation Resource is below the 0.1 MW participation threshold, as further described in the PJM Manuals. The multi-nodal DER Aggregation Resource shall also be self-scheduled into the PJM energy markets. The megawatt participation cap on the multi-nodal aggregation participation option shall be set to 167 MW within the PJM Region. The Office of the Interconnection shall conduct an assessment of the 167 MW cap upon penetration of DER Aggregation Resources participating in the limited multi-nodal aggregation option exceeding ninety percent of the 167 MW cap value. The Office of the Interconnection shall establish a periodic review, in coordination with the Electric Distribution Company and DER Aggregator, no less than annually, or more frequently as needed, to identify any permanent electrical location change that would modify the pricing node associated with a DER Aggregation Resource or its underlying Component DER. During this review, the Office of the Interconnection shall: (i) confirm that applicable data reviewed and verified in the registration process is still complete and accurate, and (ii) request any updates to such data as a condition of continued participation in the DER Aggregator Participation Model.

(d) A DER Aggregator shall self-schedule their DER Aggregation Resource into the PJM Day-ahead Energy Market and Real-time Energy Market based on bidding parameters for the applicable technology-type, as described in the PJM Manuals. A DER Aggregator shall be eligible, at their election, to offer a dispatchable range in submitting bidding parameters into the Day-ahead Energy Market and Real-time Energy Market.

(e) A DER Aggregator shall be responsible for dispatching the underlying Component DER within a DER Aggregation Resource in accordance with the Office of the

Interconnection's dispatch instructions for the DER Aggregation Resource, unless the DER Aggregator elects to designate another entity to dispatch the Component DER. A DER Aggregator shall provide telemetry for each DER Aggregation Resource participating in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model, in accordance with the technical specifications described in the PJM Manuals. A DER Aggregator may provide telemetry for the individual Component DER within a DER Aggregation Resource. This telemetry shall represent one or more values indicative of the total electrical output of the DER Aggregation Resource and inclusive of all underlying Component DER. This telemetry requirement shall not apply to a DER Aggregation Resource exclusively participating in the energy market that is less than 10 MW, notwithstanding the technical specifications described in the PJM Manuals.

A DER Aggregator shall provide to the Office of the Interconnection all individual Component DER meter data necessary to facilitate the settlement of the DER Aggregator's DER Aggregation Resource, in accordance with Operating Agreement, section 14 and the PJM Manuals. A DER Aggregator shall retain performance data for individual Component DER in a DER Aggregation Resource for auditing purposes, in accordance with the PJM Manuals. A DER Aggregator is responsible for ensuring that Component DER within a DER Aggregation Resource have metering equipment that provides integrated hourly kWh values on an Electric Distribution Company account basis. For non-interval metered residential DER Aggregation Resources, the DER Aggregator must ensure that a representative sample of Component DER have metering equipment that provides integrated hourly kWh values on an Electric Distribution Company account basis, as set forth in the PJM Manuals. For DER Aggregation Resources containing Component DER that are mass market customers, DER Aggregators shall provide aggregated meter data to the Office of the Interconnection for the settlement of the DER Aggregator's DER Aggregation Resource. Meter data shall be submitted by the DER Aggregator to the Office of Interconnection within one business day. ~~The measurement systems shall comply with the applicable Electric Distribution Company accuracy requirements for meters, and/or as described in the PJM Manual 01. Additional details for the configuration of such measurement systems under various specific configurations are specified in PJM Manual 14D.~~

The DER Aggregator shall ensure that the metering equipment for settlement has~~shall meet the Electric Distribution Company requirements for accuracy, or otherwise have~~ a maximum error of two percent over the full range of the metering equipment (including potential transformers and current transformers) and the metering equipment, metering configurations and associated data ~~shall meet~~s the requirements set forth herein and in the PJM Manuals.

(f) The Electric Distribution Company should, prior to the deadline for submission of offers into the Day-ahead Energy Market, as described in Tariff, Attachment K-Appendix, section 1.10.1A and Operating Agreement, Schedule 1, section 1.10.1A, notify the DER Aggregator of any operational limitations for the Operating Day that may impact the bidding parameters of an applicable DER Aggregation Resource. In the event that the Electric Distribution Company identifies additional operational concerns after the deadline described in Tariff, Attachment K-Appendix, section 1.10.1A and Operating Agreement, Schedule 1, section 1.10.1A, the DER Aggregator may utilize the generation rebidding period identified in Tariff,

Attachment K-Appendix, section 1.10.9, and Operating Agreement, Schedule 1, section 1.10.9, to update its bidding parameters.

During the Operating Day, the Office of the Interconnection shall dispatch the DER Aggregation Resource, in accordance with the DER Aggregator's submitted bidding parameters. The Office of the Interconnection shall make available to the Electric Distribution Company the cleared Day-ahead Energy Market schedules for the DER Aggregation Resources in their territory. During the Operating Day, an Electric Distribution Company may exercise its ability to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource, for purposes of maintaining safe and reliable operation of distribution facilities, pursuant to any applicable tariffs, agreements, and operating procedures of the Electric Distribution Company, and/or the rules and regulations of any Relevant Electric Retail Regulatory Authority. The Electric Distribution Company ~~may~~ should communicate the decision to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource directly to the DER Aggregator. Following the exercise of the Electric Distribution Company's override, the DER Aggregator shall reflect the override by updating the applicable bidding parameters of its DER Aggregation Resource. The Office of the Interconnection shall not take any actions to interrupt or interfere with the Electric Distribution Company's decision to override and will re-dispatch the DER Aggregation Resource to reflect its updated bidding parameters.

An Electric Distribution Company's override shall not excuse a DER Aggregator from any financial obligations for failure to perform under Tariff Attachment K-Appendix, Operating Agreement, Schedule 1, or Tariff, Attachment DD, including balancing Operating Reserve and other performance charges, and capacity resource non-performance and test failure charges~~the PJM Governing Agreements for failure to perform any of the obligations established under the PJM Governing Agreements or PJM Manuals for the relevant PJM capacity, energy, and/or ancillary services markets.~~

Any disputes regarding an Electric Distribution Company's exercise of its ability to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource, for purposes of maintaining safe and reliable operation of distribution facilities, pursuant to any applicable tariffs, agreements, and operating procedures of the Electric Distribution Company, and/or the rules and regulations of any Relevant Electric Retail Regulatory Authority, shall be addressed in accordance with applicable state or local law, and shall not be arbitrated or in any way resolved by the Office of the Interconnection or through the dispute resolution processes under Operating Agreement, Schedule 5.

(g) The Office of the Interconnection shall not permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model if the applicable DER Aggregation Resource includes Component DER that are end-use customers of an Electric Distribution Company that distributed 4 million MWh or less in the previous fiscal year, as identified by the Electric Distribution Company, unless the Electric Distribution Company determines that the Relevant Electric Retail Regulatory Authority permits such end-use customers to participate. The Office of the Interconnection shall permit a DER Aggregator to participate in the PJM energy, capacity, and/or

ancillary services markets through the DER Aggregator Participation Model with a DER Aggregation Resource including Component DER that are end-use customers of an Electric Distribution Company that distributed 4 million MWh or less in the previous fiscal year, as identified by the Electric Distribution Company, if, during the course of the registration process described above in Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b), the Electric Distribution Company presents any of the following evidence to PJM:

- i. an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation;
- ii. an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation; or
- iii. an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

The Office of the Interconnection shall permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model if the applicable DER Aggregation Resource includes Component DER that are end-use customers of an Electric Distribution Company that distributed more than 4 million MWh in the previous fiscal year, as identified by the Electric Distribution Company, unless the DER Aggregation Resource includes one or more Component DER that are demand response and the Relevant Electric Retail Regulatory Authority has prohibited the participation of demand response in the DER Aggregator Participation Model, pursuant to the rules set forth in Tariff, Attachment K-Appendix, section 1.5A.3 (1)(a)(i) and Operating Agreement, Schedule 1, section 1.5A.3 (1)(a)(i).

(h) A DER Aggregator may participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model using DER Aggregation Resources containing one or more Component DER that also participate in one or more retail programs. The Office of the Interconnection shall only credit a DER Aggregator for the sale of energy, capacity, and/or ancillary services in PJM markets if one or more of those same services are not also provided as part of a retail program, including but not limited to a Component DER participating in a retail net energy metering program.

A DER Aggregator may participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model using DER Aggregation Resources that provide multiple services in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model. A Component DER shall not be registered with multiple DER Aggregation Resources, or participate as part of another Market Participant outside of the DER Aggregator Participation Model. The Office of the Interconnection shall only credit a DER Aggregator for the sale of energy, capacity, and/or ancillary services in PJM

markets if one or more of those same services are not also provided as part of another wholesale sale.

(i) DER Aggregators providing capacity using a DER Capacity Aggregation Resource shall be subject to the Day-ahead Energy Market must-offer requirement described in Tariff, Attachment K-Appendix, section 1.10.1A(d) and Operating Agreement, Schedule 1, section 1.10.1A(d), based on the technology of the Component DER within the DER Aggregation Resource linked to the DER Capacity Aggregation Resource, in accordance with the PJM Manuals.

(j) DER Aggregation Resources are subject to offer price cap and associated three pivotal supplier test provisions of Operating Agreement, Schedule 1, section 6.4.

(k) A DER Capacity Aggregation Resource shall be subject to a MOPR Floor Offer Price in accordance with the provisions applicable to MOPR Floor Offer Price for Generation Capacity Resources, as described in Tariff, Attachment DD, section 5.14(h-2), and Market Seller Offer Cap for Generation Capacity Resources in a manner consistent with the provisions applicable to Market Seller Offer Cap for Generation Capacity Resources, as described in Tariff, Attachment DD, section 6.4 and Tariff, Attachment M-Appendix, section II.E, based on the underlying technology of the Component DER.

A DER Capacity Aggregation Resource may segment offers for the Component DER subject to mitigation, based on the underlying technology of the Component DER in the DER Capacity Aggregation Resource, and further described in the PJM Manuals.

If a DER Capacity Aggregation Resource is subject to the Minimum Floor Offer Price pursuant to Tariff, Attachment DD, sections 5.14(h-2), the Capacity Market Seller that owns or controls such resources may submit a Sell Offer with a Minimum Floor Offer Price of no lower than the MW-weighted average of the applicable MOPR Floor Offer Prices (zero if not applicable) of the aggregated resources in such Sell Offer.

(l) Projected PJM Market Revenues for DER Capacity Aggregation Resources subject to the Minimum Floor Offer Price or Market Seller Offer Cap shall be determined in accordance with Tariff, Attachment DD, section 6.8(d-1). The determination of PJM Market Revenues by the Market Monitoring Unit or the Office of the Interconnection shall utilize either the hourly output profiles, or the Projected EAS Dispatch, as appropriate

(m) The Office of the Interconnection shall account for and settle a DER Aggregator's DER Aggregation Resource, in the Day-ahead Energy Market and Real-time Energy Market, by summing all load reduction and injection MWh for the underlying Component DER within the Aggregation. The Office of the Interconnection shall calculate the performance of Component DER that have both load reduction and injection capability as follows:

(i) load reduction to 0 MWh shall be calculated in accordance with Tariff, Attachment K-Appendix, sections 1.5A and 3.3A and Operating Agreement, Schedule 1, sections 1.5A and 3.3A;

(ii) injection shall be determined in accordance with the Day-ahead Energy Market and Real-time Energy Market rules as specified in Tariff, Attachment K-Appendix, section 3.1A, and Operating Agreement, Schedule 1, section 3.1A.

(n) Component DER interconnecting to distribution facilities for purposes of participating in the energy, capacity, and/or ancillary services markets of PJM exclusively through the DER Aggregator Participation Model shall not be subject to the Part IV of the Tariff relating to interconnections with the Transmission System, and shall exclusively interconnect to distribution facilities pursuant to applicable state or local law.

PJM Operating Agreement
Schedule 1, section 1.4B

1.4B DER Aggregator Participation Model

(a) The rules and procedures for the participation of DER Aggregators are established pursuant to this section 1.4B and the PJM Manuals.

(b) In order to participate in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model, a DER Aggregator shall register each DER Aggregation Resource and DER Capacity Aggregation Resource with the Office of the Interconnection, in accordance with the procedures established under the PJM Manuals. For each Component DER in a DER Aggregation Resource, the DER Aggregator shall provide:

i. Identifying information, including the physical address and Electric Distribution Company account number;

ii. Metering information, including meter type (e.g., Electric Distribution Company meter, other meter);

iii. Capability information, including load reduction and injection capability.

The Electric Distribution Company review portion of the registration process shall commence after: (1) the Office of the Interconnection has an executed DER Aggregator Participation Service Agreement on file, to be used for all DER Aggregation Resources associated with the DER Aggregator; and (2) the Office of the Interconnection receives a complete registration from the DER Aggregator, in a form specified in the PJM Manuals.

Upon receipt of a DER Aggregator's completed registration, the Office of the Interconnection shall review the registration and data submitted therein for completeness, and verify that the DER Aggregator meets the eligibility criteria for participation in the DER Aggregator Participation Model, as defined under the PJM Tariff and Operating Agreement and Manuals. The DER Aggregator shall only submit a registration for Component DER that are under contract for the term of the registration, and only one DER Aggregator may operate Component DER at a specific location. The Office of the Interconnection shall notify the appropriate Electric Distribution Company of the DER Aggregator's registration through the appropriate PJM system. A single registration shall only be comprised of individual Component DER in the same state, Electric Distribution Company, Transmission Zone, and pricing point unless otherwise noted below.

The Electric Distribution Company review process shall consist of two periods, in sum not to exceed sixty calendar days. The first shall be a single period, not to exceed fifteen calendar days, during which time the Electric Distribution Company and the Office of the Interconnection shall review and verify each Component DER for which a location was created. The second shall be a single period, not to exceed forty-five calendar days, during which the Electric Distribution Company shall perform a reliability review of the DER Aggregation Resource. In the event that the last day of either the fifteen or forty-five calendar day review period falls on a weekend or holiday, the review period shall conclude on the next business day.

The first fifteen calendar day review period shall commence upon receipt by the Electric Distribution Company of notification from the Office of the Interconnection. Following notification, the Electric Distribution Company may review and verify, as applicable, the Component DER for which a location was created and the following information associated therewith:

- i. The location and data components that represents each Component DER, as further defined in the relevant PJM Manuals, are accurate;
- ii. Participation of the Component DER in an Electric Distribution Company's retail program at the time of registration does not preclude participation of the Component DER in the energy, capacity, and/or ancillary services markets of PJM, and as defined in the PJM Manuals;
 - a. Component DER that participate in a net energy metering retail program may only participate with grid injections in the PJM ancillary services markets, and may not participate with injections in PJM energy or capacity markets, unless:
 1. the Electric Distribution Company confirms to the Office of the Interconnection that participation of the Component DER in a net energy metering retail program or tariff approved by the Relevant Electric Retail Regulatory Authority will not violate the restrictions on duplicative compensation, as described in Tariff, Attachment K-Appendix, section 1.4B(h) and Operating Agreement, Schedule 1, section 1.4B(h); and
 2. the Office of the Interconnection determines that the participation of the Component DER otherwise meets the applicable requirements for energy market or capacity market participation.
 - b. Component DER that participate in a net energy metering retail program that also participate with grid injections in the PJM ancillary services markets shall, based on the information provided by the DER Aggregator or the Electric Distribution Company, be excluded from PJM energy market settlements.
- iii. The Component DER complies with the rules and regulations of any applicable Relevant Electric Retail Regulatory Authority;
- iv. The Relevant Electric Retail Regulatory Authority allows the participation of any applicable Component DER that are also end-use customers of an Electric Distribution Company, in accordance with the provisions of Tariff, Attachment K-Appendix, section 1.4B(g), and Operating Agreement, Schedule 1, section 1.4B(g).

Within the first fifteen calendar day review period, and in coordination with the Office of Interconnection, the Electric Distribution Company shall also assign the electrical node on the PJM Transmission System to each Component DER. The Office of the Interconnection shall ensure that any information regarding Component DER that the Office of the Interconnection receives from an Electric Distribution Company or a DER Aggregator is accessible to both the Electric Distribution Company and the DER Aggregator.

Following approval of the Component DER by the Electric Distribution Company and the Office of the Interconnection, the DER Aggregator shall designate DER Aggregation Resources comprising of one or more of the approved Component DER. The second forty-five calendar day review period shall commence upon [receipt by the Electric Distribution Company of notification of](#) such designation by the DER Aggregator, [from the Office of the Interconnection](#) whereby the Electric Distribution Company shall review the DER Aggregation Resource and verify that the participation of the DER Aggregation Resource in the PJM energy, capacity, and/or ancillary service markets does not pose a threat to the reliable and safe operation of the distribution system, the public, or Electric Distribution Company personnel. The scope of the Electric Distribution Company review of distribution system reliability impacts shall be limited to any incremental impacts arising from a Component DER participation in a DER Aggregation Resource that were not previously considered by the Electric Distribution Company during the interconnection study process for that Component DER.

If the Electric Distribution Company identifies concerns during the Electric Distribution Company review portion of the registration process, the Electric Distribution Company may notify the Office of the Interconnection and the DER Aggregator, and the Electric Distribution Company and the DER Aggregator may first attempt to resolve those concerns bilaterally, or in accordance with applicable state or local law, prior to seeking initiation of the dispute resolution process described in Operating Agreement, Schedule 5. Issues within disputes that the Office of the Interconnection determines solely concern the application of any applicable tariffs, agreements, and operating procedures of the Electric Distribution Company, and/or the rules and regulations of any Relevant Electric Retail Regulatory Authority, shall be addressed in accordance with applicable state or local law, and shall not be arbitrated or in any way resolved by the Office of the Interconnection or through the dispute resolution processes under Operating Agreement, Schedule 5. Issues within disputes that the Office of the Interconnection determines concern the provisions of the PJM Governing Agreements may be arbitrated under the dispute resolution processes under Operating Agreement, Schedule 5.

In the event that the Electric Distribution Company's concerns are resolved within the Electric Distribution Company review portion of the registration process, the Electric Distribution Company may recommend that the Office of the Interconnection approve the location and/or registration, as applicable. In the event that the concerns identified by the Electric Distribution Company are not resolved, the Electric Distribution Company may, within the Electric Distribution Company review portion of the registration process, recommend that the Office of the Interconnection: (i) reject the location and/or registration, (ii) approve the registration with certain operational limitations on the DER Aggregation Resource identified in the registration, or

(iii) approve the registration with the removal of one or more specific Component DER from the DER Aggregation Resource identified in the registration.

Following the Electric Distribution Company's review of the DER Aggregation Resource registration, within fifteen calendar days, the Office of the Interconnection shall apply the applicable pricing points to the DER Aggregation Resource, and shall either approve or deny the DER Aggregator's registration based on the Office of the Interconnection's review of the registration and receipt and review of the Electric Distribution Company's comments and recommendation, with deference given to the Electric Distribution Company's assessment of the impact of the DER Aggregator's registration on the safety and reliability of distribution facilities. To the extent that no comments or recommendations are provided by the Electric Distribution Company, including after the Office of the Interconnection provides final notice to the Electric Distribution Company prior to the expiration of the Electric Distribution Company review portion of the registration process, the Office of the Interconnection shall approve the DER Aggregator's registration.

All DER Aggregators shall remain in full compliance with the tariffs, agreements, and operating procedures of the applicable Electric Distribution Company, and the rules and regulations of any Relevant Electric Retail Regulatory Authority, in accordance with their executed DER Aggregator Participation Service Agreement, at all times while participating in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model.

Transmission Owners shall, in coordination with the Office of the Interconnection, provide all data to the Office of the Interconnection reasonably required to accurately represent the DER Aggregation Resource in the Regional Transmission Expansion Plan, in accordance with Operating Agreement, section 1.5.4 and the PJM Manuals.

A DER Aggregator shall report to the Office of the Interconnection any proposed update to the inventory of the individual Component DER within the DER Aggregation Resource, or proposed additional market services provided by the DER Aggregation Resource, identified in the DER Aggregator's registration to reflect any proposed addition or subtraction of a Component DER or market service, and any applicable information or data associated with the Component DER or market service, in accordance with the specifications described in the PJM Manuals. Any proposed update shall not require a new registration of the existing Component DER within the approved DER Aggregation Resource. Upon the Electric Distribution Company's receipt of notification of any proposed update, including all applicable information or data, the host Electric Distribution Company shall have an opportunity to conduct a review, for the first fifteen calendar day and/or second forty-five calendar day review period, in accordance with the provisions of this section related to initial registration, and make a recommendation to the Office of the Interconnection, prior to the Office of the Interconnection approving or denying the proposed update to the DER Aggregation Resource. The DER Aggregator may continue to participate in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model using its existing approved DER Aggregation Resource during the course of any such review conducted by the Electric Distribution Company. An inventory of the individual Component DER within a DER Aggregation Resource registration that is linked to

a DER Capacity Aggregation Resource may not be modified during the course of an applicable Delivery Year.

(c) All Component DER in a DER Aggregation Resource shall interface with the same primary pricing node, except: (i) in the case of a DER Aggregation Resource that only provides ancillary services and is less than or equal to 5 MW, the Component DER within the DER Aggregation Resource may interface with multiple primary pricing nodes, so long as those primary pricing nodes are in the same state, service territory of a single Electric Distribution Company and Transmission Zone; and (ii) in the case of a DER Aggregation Resource utilizing the limited multi-nodal aggregation participation option described below, so long as those primary pricing nodes are in the same state, service territory of a single Electric Distribution Company and Transmission Zone, and meet the criteria defined below and in the PJM Manuals; and (iii) in the case of a DER Capacity Aggregation Resource, the Component DER within a DER Aggregation Resource(s) linked to the DER Capacity Aggregation Resource may interface with multiple primary pricing nodes, so long as those primary pricing nodes are located within a defined zone or sub-zonal Locational Deliverability Area.

The purpose of participating under the limited multi-nodal aggregation option is to allow the participation of Component DER in the energy market that cannot form aggregations at a single primary pricing node at the minimum capability criteria of 0.1 MW. To participate, the multi-nodal DER Aggregation Resource may be comprised of one or more Component DER with capability smaller than 0.1 MW. Component DER at a single primary node with capability greater than 0.1 MW shall be excluded from participation in the multi-nodal DER Aggregation Resource unless the total capability of all other Component DER in a DER Aggregation Resource is below the 0.1 MW participation threshold, as further described in the PJM Manuals. The multi-nodal DER Aggregation Resource shall also be self-scheduled into the PJM energy markets. The megawatt participation cap on the multi-nodal aggregation participation option shall be set to 167 MW within the PJM Region. The Office of the Interconnection shall conduct an assessment of the 167 MW cap upon penetration of DER Aggregation Resources participating in the limited multi-nodal aggregation option exceeding ninety percent of the 167 MW cap value. The Office of the Interconnection shall establish a periodic review, in coordination with the Electric Distribution Company and DER Aggregator, no less than annually, or more frequently as needed, to identify any permanent electrical location change that would modify the pricing node associated with a DER Aggregation Resource or its underlying Component DER. During this review, the Office of the Interconnection shall: (i) confirm that applicable data reviewed and verified in the registration process is still complete and accurate, and (ii) request any updates to such data as a condition of continued participation in the DER Aggregator Participation Model.

(d) A DER Aggregator shall self-schedule their DER Aggregation Resource into the PJM Day-ahead Energy Market and Real-time Energy Market based on bidding parameters for the applicable technology-type, as described in the PJM Manuals. A DER Aggregator shall be eligible, at their election, to offer a dispatchable range in submitting bidding parameters into the Day-ahead Energy Market and Real-time Energy Market.

(e) A DER Aggregator shall be responsible for dispatching the underlying Component DER within a DER Aggregation Resource in accordance with the Office of the

Interconnection's dispatch instructions for the DER Aggregation Resource, unless the DER Aggregator elects to designate another entity to dispatch the Component DER. A DER Aggregator shall provide telemetry for each DER Aggregation Resource participating in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model, in accordance with the technical specifications described in the PJM Manuals. A DER Aggregator may provide telemetry for the individual Component DER within a DER Aggregation Resource. This telemetry shall represent one or more values indicative of the total electrical output of the DER Aggregation Resource and inclusive of all underlying Component DER. This telemetry requirement shall not apply to a DER Aggregation Resource exclusively participating in the energy market that is less than 10 MW, notwithstanding the technical specifications described in the PJM Manuals.

A DER Aggregator shall provide to the Office of the Interconnection all individual Component DER meter data necessary to facilitate the settlement of the DER Aggregator's DER Aggregation Resource, in accordance with Operating Agreement, section 14 and the PJM Manuals. A DER Aggregator shall retain performance data for individual Component DER in a DER Aggregation Resource for auditing purposes, in accordance with the PJM Manuals. A DER Aggregator is responsible for ensuring that Component DER within a DER Aggregation Resource have metering equipment that provides integrated hourly kWh values on an Electric Distribution Company account basis. For non-interval metered residential DER Aggregation Resources, the DER Aggregator must ensure that a representative sample of Component DER have metering equipment that provides integrated hourly kWh values on an Electric Distribution Company account basis, as set forth in the PJM Manuals. For DER Aggregation Resources containing Component DER that are mass market customers, DER Aggregators shall provide aggregated meter data to the Office of the Interconnection for the settlement of the DER Aggregator's DER Aggregation Resource. Meter data shall be submitted by the DER Aggregator to the Office of Interconnection within one business day. ~~The measurement systems shall comply with the applicable Electric Distribution Company accuracy requirements for meters, and/or as described in the PJM Manual 01. Additional details for the configuration of such measurement systems under various specific configurations are specified in PJM Manual 14D.~~

The DER Aggregator shall ensure that the metering equipment for settlement has~~shall meet the Electric Distribution Company requirements for accuracy, or otherwise have~~ a maximum error of two percent over the full range of the metering equipment (including potential transformers and current transformers) and the metering equipment, metering configurations and associated data ~~shall meet~~s the requirements set forth herein and in the PJM Manuals.

(f) The Electric Distribution Company should, prior to the deadline for submission of offers into the Day-ahead Energy Market, as described in Tariff, Attachment K-Appendix, section 1.10.1A and Operating Agreement, Schedule 1, section 1.10.1A, notify the DER Aggregator of any operational limitations for the Operating Day that may impact the bidding parameters of an applicable DER Aggregation Resource. In the event that the Electric Distribution Company identifies additional operational concerns after the deadline described in Tariff, Attachment K-Appendix, section 1.10.1A and Operating Agreement, Schedule 1, section 1.10.1A, the DER Aggregator may utilize the generation rebidding period identified in Tariff,

Attachment K-Appendix, section 1.10.9, and Operating Agreement, Schedule 1, section 1.10.9, to update its bidding parameters.

During the Operating Day, the Office of the Interconnection shall dispatch the DER Aggregation Resource, in accordance with the DER Aggregator's submitted bidding parameters. The Office of the Interconnection shall make available to the Electric Distribution Company the cleared Day-ahead Energy Market schedules for the DER Aggregation Resources in their territory. During the Operating Day, an Electric Distribution Company may exercise its ability to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource, for purposes of maintaining safe and reliable operation of distribution facilities, pursuant to any applicable tariffs, agreements, and operating procedures of the Electric Distribution Company, and/or the rules and regulations of any Relevant Electric Retail Regulatory Authority. The Electric Distribution Company ~~may~~ should communicate the decision to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource directly to the DER Aggregator. Following the exercise of the Electric Distribution Company's override, the DER Aggregator shall reflect the override by updating the applicable bidding parameters of its DER Aggregation Resource. The Office of the Interconnection shall not take any actions to interrupt or interfere with the Electric Distribution Company's decision to override and will re-dispatch the DER Aggregation Resource to reflect its updated bidding parameters.

An Electric Distribution Company's override shall not excuse a DER Aggregator from any financial obligations for failure to perform under Tariff Attachment K-Appendix, Operating Agreement, Schedule 1, or Tariff, Attachment DD, including balancing Operating Reserve and other performance charges, and capacity resource non-performance and test failure charges~~the PJM Governing Agreements for failure to perform any of the obligations established under the PJM Governing Agreements or PJM Manuals for the relevant PJM capacity, energy, and/or ancillary services markets.~~

Any disputes regarding an Electric Distribution Company's exercise of its ability to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource, for purposes of maintaining safe and reliable operation of distribution facilities, pursuant to any applicable tariffs, agreements, and operating procedures of the Electric Distribution Company, and/or the rules and regulations of any Relevant Electric Retail Regulatory Authority, shall be addressed in accordance with applicable state or local law, and shall not be arbitrated or in any way resolved by the Office of the Interconnection or through the dispute resolution processes under Operating Agreement, Schedule 5.

(g) The Office of the Interconnection shall not permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model if the applicable DER Aggregation Resource includes Component DER that are end-use customers of an Electric Distribution Company that distributed 4 million MWh or less in the previous fiscal year, as identified by the Electric Distribution Company, unless the Electric Distribution Company determines that the Relevant Electric Retail Regulatory Authority permits such end-use customers to participate. The Office of the Interconnection shall permit a DER Aggregator to participate in the PJM energy, capacity, and/or

ancillary services markets through the DER Aggregator Participation Model with a DER Aggregation Resource including Component DER that are end-use customers of an Electric Distribution Company that distributed 4 million MWh or less in the previous fiscal year, as identified by the Electric Distribution Company, if, during the course of the registration process described above in Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b), the Electric Distribution Company presents any of the following evidence to PJM:

- i. an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation;
- ii. an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation; or
- iii. an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

The Office of the Interconnection shall permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model if the applicable DER Aggregation Resource includes Component DER that are end-use customers of an Electric Distribution Company that distributed more than 4 million MWh in the previous fiscal year, as identified by the Electric Distribution Company, unless the DER Aggregation Resource includes one or more Component DER that are demand response and the Relevant Electric Retail Regulatory Authority has prohibited the participation of demand response in the DER Aggregator Participation Model, pursuant to the rules set forth in Tariff, Attachment K-Appendix, section 1.5A.3 (1)(a)(i) and Operating Agreement, Schedule 1, section 1.5A.3 (1)(a)(i).

(h) A DER Aggregator may participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model using DER Aggregation Resources containing one or more Component DER that also participate in one or more retail programs. The Office of the Interconnection shall only credit a DER Aggregator for the sale of energy, capacity, and/or ancillary services in PJM markets if one or more of those same services are not also provided as part of a retail program, including but not limited to a Component DER participating in a retail net energy metering program.

A DER Aggregator may participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model using DER Aggregation Resources that provide multiple services in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model. A Component DER shall not be registered with multiple DER Aggregation Resources, or participate as part of another Market Participant outside of the DER Aggregator Participation Model. The Office of the Interconnection shall only credit a DER Aggregator for the sale of energy, capacity, and/or ancillary services in PJM

markets if one or more of those same services are not also provided as part of another wholesale sale.

(i) DER Aggregators providing capacity using a DER Capacity Aggregation Resource shall be subject to the Day-ahead Energy Market must-offer requirement described in Tariff, Attachment K-Appendix, section 1.10.1A(d) and Operating Agreement, Schedule 1, section 1.10.1A(d), based on the technology of the Component DER within the DER Aggregation Resource linked to the DER Capacity Aggregation Resource, in accordance with the PJM Manuals.

(j) DER Aggregation Resources are subject to offer price cap and associated three pivotal supplier test provisions of Operating Agreement, Schedule 1, section 6.4.

(k) A DER Capacity Aggregation Resource shall be subject to a MOPR Floor Offer Price in accordance with the provisions applicable to MOPR Floor Offer Price for Generation Capacity Resources, as described in Tariff, Attachment DD, section 5.14(h-2), and Market Seller Offer Cap for Generation Capacity Resources in a manner consistent with the provisions applicable to Market Seller Offer Cap for Generation Capacity Resources, as described in Tariff, Attachment DD, section 6.4 and Tariff, Attachment M-Appendix, section II.E, based on the underlying technology of the Component DER.

A DER Capacity Aggregation Resource may segment offers for the Component DER subject to mitigation, based on the underlying technology of the Component DER in the DER Capacity Aggregation Resource, and further described in the PJM Manuals.

If a DER Capacity Aggregation Resource is subject to the Minimum Floor Offer Price pursuant to Tariff, Attachment DD, sections 5.14(h-2), the Capacity Market Seller that owns or controls such resources may submit a Sell Offer with a Minimum Floor Offer Price of no lower than the MW-weighted average of the applicable MOPR Floor Offer Prices (zero if not applicable) of the aggregated resources in such Sell Offer.

(l) Projected PJM Market Revenues for DER Capacity Aggregation Resources subject to the Minimum Floor Offer Price or Market Seller Offer Cap shall be determined in accordance with Tariff, Attachment DD, section 6.8(d-1). The determination of PJM Market Revenues by the Market Monitoring Unit or the Office of the Interconnection shall utilize either the hourly output profiles, or the Projected EAS Dispatch, as appropriate

(m) The Office of the Interconnection shall account for and settle a DER Aggregator's DER Aggregation Resource, in the Day-ahead Energy Market and Real-time Energy Market, by summing all load reduction and injection MWh for the underlying Component DER within the Aggregation. The Office of the Interconnection shall calculate the performance of Component DER that have both load reduction and injection capability as follows:

(i) load reduction to 0 MWh shall be calculated in accordance with Tariff, Attachment K-Appendix, sections 1.5A and 3.3A and Operating Agreement, Schedule 1, sections 1.5A and 3.3A;

(ii) injection shall be determined in accordance with the Day-ahead Energy Market and Real-time Energy Market rules as specified in Tariff, Attachment K-Appendix, section 3.1A, and Operating Agreement, Schedule 1, section 3.1A.

(n) Component DER interconnecting to distribution facilities for purposes of participating in the energy, capacity, and/or ancillary services markets of PJM exclusively through the DER Aggregator Participation Model shall not be subject to the Part IV of the Tariff relating to interconnections with the Transmission System, and shall exclusively interconnect to distribution facilities pursuant to applicable state or local law.

Attachment B

Revisions to the PJM Open Access Transmission Tariff and Operating Agreement

(Identified by Additional Cover Pages)

(Clean Format)

PJM Open Access Transmission Tariff
Attachment K-Appendix, section 1.4B

1.4B DER Aggregator Participation Model

(a) The rules and procedures for the participation of DER Aggregators are established pursuant to this section 1.4B and the PJM Manuals.

(b) In order to participate in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model, a DER Aggregator shall register each DER Aggregation Resource and DER Capacity Aggregation Resource with the Office of the Interconnection, in accordance with the procedures established under the PJM Manuals. For each Component DER in a DER Aggregation Resource, the DER Aggregator shall provide:

- i. Identifying information, including the physical address and Electric Distribution Company account number;
- ii. Metering information, including meter type (e.g., Electric Distribution Company meter, other meter);
- iii. Capability information, including load reduction and injection capability.

The Electric Distribution Company review portion of the registration process shall commence after: (1) the Office of the Interconnection has an executed DER Aggregator Participation Service Agreement on file, to be used for all DER Aggregation Resources associated with the DER Aggregator; and (2) the Office of the Interconnection receives a complete registration from the DER Aggregator, in a form specified in the PJM Manuals.

Upon receipt of a DER Aggregator's completed registration, the Office of the Interconnection shall review the registration and data submitted therein for completeness, and verify that the DER Aggregator meets the eligibility criteria for participation in the DER Aggregator Participation Model, as defined under the PJM Tariff and Operating Agreement and Manuals. The DER Aggregator shall only submit a registration for Component DER that are under contract for the term of the registration, and only one DER Aggregator may operate Component DER at a specific location. The Office of the Interconnection shall notify the appropriate Electric Distribution Company of the DER Aggregator's registration through the appropriate PJM system. A single registration shall only be comprised of individual Component DER in the same state, Electric Distribution Company, Transmission Zone, and pricing point unless otherwise noted below.

The Electric Distribution Company review process shall consist of two periods, in sum not to exceed sixty calendar days. The first shall be a single period, not to exceed fifteen calendar days, during which time the Electric Distribution Company and the Office of the Interconnection shall review and verify each Component DER for which a location was created. The second shall be a single period, not to exceed forty-five calendar days, during which the Electric Distribution Company shall perform a reliability review of the DER Aggregation Resource. In the event that the last day of either the fifteen or forty-five calendar day review period falls on a weekend or holiday, the review period shall conclude on the next business day.

The first fifteen calendar day review period shall commence upon receipt by the Electric Distribution Company of notification from the Office of the Interconnection. Following notification, the Electric Distribution Company may review and verify, as applicable, the Component DER for which a location was created and the following information associated therewith:

- i. The location and data components that represents each Component DER, as further defined in the relevant PJM Manuals, are accurate;
- ii. Participation of the Component DER in an Electric Distribution Company's retail program at the time of registration does not preclude participation of the Component DER in the energy, capacity, and/or ancillary services markets of PJM, and as defined in the PJM Manuals;
 - a. Component DER that participate in a net energy metering retail program may only participate with grid injections in the PJM ancillary services markets, and may not participate with injections in PJM energy or capacity markets, unless:
 1. the Electric Distribution Company confirms to the Office of the Interconnection that participation of the Component DER in a net energy metering retail program or tariff approved by the Relevant Electric Retail Regulatory Authority will not violate the restrictions on duplicative compensation, as described in Tariff, Attachment K-Appendix, section 1.4B(h) and Operating Agreement, Schedule 1, section 1.4B(h); and
 2. the Office of the Interconnection determines that the participation of the Component DER otherwise meets the applicable requirements for energy market or capacity market participation.
 - b. Component DER that participate in a net energy metering retail program that also participate with grid injections in the PJM ancillary services markets shall, based on the information provided by the DER Aggregator or the Electric Distribution Company, be excluded from PJM energy market settlements.
- iii. The Component DER complies with the rules and regulations of any applicable Relevant Electric Retail Regulatory Authority;
- iv. The Relevant Electric Retail Regulatory Authority allows the participation of any applicable Component DER that are also end-use customers of an Electric Distribution Company, in accordance with the provisions of Tariff, Attachment K-Appendix, section 1.4B(g), and Operating Agreement, Schedule 1, section 1.4B(g).

Within the first fifteen calendar day review period, and in coordination with the Office of Interconnection, the Electric Distribution Company shall also assign the electrical node on the PJM Transmission System to each Component DER. The Office of the Interconnection shall ensure that any information regarding Component DER that the Office of the Interconnection receives from an Electric Distribution Company or a DER Aggregator is accessible to both the Electric Distribution Company and the DER Aggregator.

Following approval of the Component DER by the Electric Distribution Company and the Office of the Interconnection, the DER Aggregator shall designate DER Aggregation Resources comprising of one or more of the approved Component DER. The second forty-five calendar day review period shall commence upon receipt by the Electric Distribution Company of notification of such designation by the DER Aggregator, from the Office of the Interconnection whereby the Electric Distribution Company shall review the DER Aggregation Resource and verify that the participation of the DER Aggregation Resource in the PJM energy, capacity, and/or ancillary service markets does not pose a threat to the reliable and safe operation of the distribution system, the public, or Electric Distribution Company personnel. The scope of the Electric Distribution Company review of distribution system reliability impacts shall be limited to any incremental impacts arising from a Component DER participation in a DER Aggregation Resource that were not previously considered by the Electric Distribution Company during the interconnection study process for that Component DER.

If the Electric Distribution Company identifies concerns during the Electric Distribution Company review portion of the registration process, the Electric Distribution Company may notify the Office of the Interconnection and the DER Aggregator, and the Electric Distribution Company and the DER Aggregator may first attempt to resolve those concerns bilaterally, or in accordance with applicable state or local law, prior to seeking initiation of the dispute resolution process described in Operating Agreement, Schedule 5. Issues within disputes that the Office of the Interconnection determines solely concern the application of any applicable tariffs, agreements, and operating procedures of the Electric Distribution Company, and/or the rules and regulations of any Relevant Electric Retail Regulatory Authority, shall be addressed in accordance with applicable state or local law, and shall not be arbitrated or in any way resolved by the Office of the Interconnection or through the dispute resolution processes under Operating Agreement, Schedule 5. Issues within disputes that the Office of the Interconnection determines concern the provisions of the PJM Governing Agreements may be arbitrated under the dispute resolution processes under Operating Agreement, Schedule 5.

In the event that the Electric Distribution Company's concerns are resolved within the Electric Distribution Company review portion of the registration process, the Electric Distribution Company may recommend that the Office of the Interconnection approve the location and/or registration, as applicable. In the event that the concerns identified by the Electric Distribution Company are not resolved, the Electric Distribution Company may, within the Electric Distribution Company review portion of the registration process, recommend that the Office of the Interconnection: (i) reject the location and/or registration, (ii) approve the registration with certain operational limitations on the DER Aggregation Resource identified in the registration, or

(iii) approve the registration with the removal of one or more specific Component DER from the DER Aggregation Resource identified in the registration.

Following the Electric Distribution Company's review of the DER Aggregation Resource registration, within fifteen calendar days, the Office of the Interconnection shall apply the applicable pricing points to the DER Aggregation Resource, and shall either approve or deny the DER Aggregator's registration based on the Office of the Interconnection's review of the registration and receipt and review of the Electric Distribution Company's comments and recommendation, with deference given to the Electric Distribution Company's assessment of the impact of the DER Aggregator's registration on the safety and reliability of distribution facilities. To the extent that no comments or recommendations are provided by the Electric Distribution Company, including after the Office of the Interconnection provides final notice to the Electric Distribution Company prior to the expiration of the Electric Distribution Company review portion of the registration process, the Office of the Interconnection shall approve the DER Aggregator's registration.

All DER Aggregators shall remain in full compliance with the tariffs, agreements, and operating procedures of the applicable Electric Distribution Company, and the rules and regulations of any Relevant Electric Retail Regulatory Authority, in accordance with their executed DER Aggregator Participation Service Agreement, at all times while participating in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model.

Transmission Owners shall, in coordination with the Office of the Interconnection, provide all data to the Office of the Interconnection reasonably required to accurately represent the DER Aggregation Resource in the Regional Transmission Expansion Plan, in accordance with Operating Agreement, section 1.5.4 and the PJM Manuals.

A DER Aggregator shall report to the Office of the Interconnection any proposed update to the inventory of the individual Component DER within the DER Aggregation Resource, or proposed additional market services provided by the DER Aggregation Resource, identified in the DER Aggregator's registration to reflect any proposed addition or subtraction of a Component DER or market service, and any applicable information or data associated with the Component DER or market service, in accordance with the specifications described in the PJM Manuals. Any proposed update shall not require a new registration of the existing Component DER within the approved DER Aggregation Resource. Upon the Electric Distribution Company's receipt of notification of any proposed update, including all applicable information or data, the host Electric Distribution Company shall have an opportunity to conduct a review, for the first fifteen calendar day and/or second forty-five calendar day review period, in accordance with the provisions of this section related to initial registration, and make a recommendation to the Office of the Interconnection, prior to the Office of the Interconnection approving or denying the proposed update to the DER Aggregation Resource. The DER Aggregator may continue to participate in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model using its existing approved DER Aggregation Resource during the course of any such review conducted by the Electric Distribution Company. An inventory of the individual Component DER within a DER Aggregation Resource registration that is linked to

a DER Capacity Aggregation Resource may not be modified during the course of an applicable Delivery Year.

(c) All Component DER in a DER Aggregation Resource shall interface with the same primary pricing node, except: (i) in the case of a DER Aggregation Resource that only provides ancillary services and is less than or equal to 5 MW, the Component DER within the DER Aggregation Resource may interface with multiple primary pricing nodes, so long as those primary pricing nodes are in the same state, service territory of a single Electric Distribution Company and Transmission Zone; and (ii) in the case of a DER Aggregation Resource utilizing the limited multi-nodal aggregation participation option described below, so long as those primary pricing nodes are in the same state, service territory of a single Electric Distribution Company and Transmission Zone, and meet the criteria defined below and in the PJM Manuals; and (iii) in the case of a DER Capacity Aggregation Resource, the Component DER within a DER Aggregation Resource(s) linked to the DER Capacity Aggregation Resource may interface with multiple primary pricing nodes, so long as those primary pricing nodes are located within a defined zone or sub-zonal Locational Deliverability Area.

The purpose of participating under the limited multi-nodal aggregation option is to allow the participation of Component DER in the energy market that cannot form aggregations at a single primary pricing node at the minimum capability criteria of 0.1 MW. To participate, the multi-nodal DER Aggregation Resource may be comprised of one or more Component DER with capability smaller than 0.1 MW. Component DER at a single primary node with capability greater than 0.1 MW shall be excluded from participation in the multi-nodal DER Aggregation Resource unless the total capability of all other Component DER in a DER Aggregation Resource is below the 0.1 MW participation threshold, as further described in the PJM Manuals. The multi-nodal DER Aggregation Resource shall also be self-scheduled into the PJM energy markets. The megawatt participation cap on the multi-nodal aggregation participation option shall be set to 167 MW within the PJM Region. The Office of the Interconnection shall conduct an assessment of the 167 MW cap upon penetration of DER Aggregation Resources participating in the limited multi-nodal aggregation option exceeding ninety percent of the 167 MW cap value. The Office of the Interconnection shall establish a periodic review, in coordination with the Electric Distribution Company and DER Aggregator, no less than annually, or more frequently as needed, to identify any permanent electrical location change that would modify the pricing node associated with a DER Aggregation Resource or its underlying Component DER. During this review, the Office of the Interconnection shall: (i) confirm that applicable data reviewed and verified in the registration process is still complete and accurate, and (ii) request any updates to such data as a condition of continued participation in the DER Aggregator Participation Model.

(d) A DER Aggregator shall self-schedule their DER Aggregation Resource into the PJM Day-ahead Energy Market and Real-time Energy Market based on bidding parameters for the applicable technology-type, as described in the PJM Manuals. A DER Aggregator shall be eligible, at their election, to offer a dispatchable range in submitting bidding parameters into the Day-ahead Energy Market and Real-time Energy Market.

(e) A DER Aggregator shall be responsible for dispatching the underlying Component DER within a DER Aggregation Resource in accordance with the Office of the

Interconnection's dispatch instructions for the DER Aggregation Resource, unless the DER Aggregator elects to designate another entity to dispatch the Component DER. A DER Aggregator shall provide telemetry for each DER Aggregation Resource participating in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model, in accordance with the technical specifications described in the PJM Manuals. A DER Aggregator may provide telemetry for the individual Component DER within a DER Aggregation Resource. This telemetry shall represent one or more values indicative of the total electrical output of the DER Aggregation Resource and inclusive of all underlying Component DER. This telemetry requirement shall not apply to a DER Aggregation Resource exclusively participating in the energy market that is less than 10 MW, notwithstanding the technical specifications described in the PJM Manuals.

A DER Aggregator shall provide to the Office of the Interconnection all individual Component DER meter data necessary to facilitate the settlement of the DER Aggregator's DER Aggregation Resource, in accordance with Operating Agreement, section 14 and the PJM Manuals. A DER Aggregator shall retain performance data for individual Component DER in a DER Aggregation Resource for auditing purposes, in accordance with the PJM Manuals. A DER Aggregator is responsible for ensuring that Component DER within a DER Aggregation Resource have metering equipment that provides integrated hourly kWh values on an Electric Distribution Company account basis. For non-interval metered residential DER Aggregation Resources, the DER Aggregator must ensure that a representative sample of Component DER have metering equipment that provides integrated hourly kWh values on an Electric Distribution Company account basis, as set forth in the PJM Manuals. For DER Aggregation Resources containing Component DER that are mass market customers, DER Aggregators shall provide aggregated meter data to the Office of the Interconnection for the settlement of the DER Aggregator's DER Aggregation Resource. Meter data shall be submitted by the DER Aggregator to the Office of Interconnection within one business day.

The DER Aggregator shall ensure that the metering equipment for settlement has a maximum error of two percent over the full range of the metering equipment (including potential transformers and current transformers) and the metering equipment, metering configurations and associated data meets the requirements set forth herein and in the PJM Manuals.

(f) The Electric Distribution Company should, prior to the deadline for submission of offers into the Day-ahead Energy Market, as described in Tariff, Attachment K-Appendix, section 1.10.1A and Operating Agreement, Schedule 1, section 1.10.1A, notify the DER Aggregator of any operational limitations for the Operating Day that may impact the bidding parameters of an applicable DER Aggregation Resource. In the event that the Electric Distribution Company identifies additional operational concerns after the deadline described in Tariff, Attachment K-Appendix, section 1.10.1A and Operating Agreement, Schedule 1, section 1.10.1A, the DER Aggregator may utilize the generation rebidding period identified in Tariff, Attachment K-Appendix, section 1.10.9, and Operating Agreement, Schedule 1, section 1.10.9, to update its bidding parameters.

During the Operating Day, the Office of the Interconnection shall dispatch the DER Aggregation Resource, in accordance with the DER Aggregator's submitted bidding parameters. The Office

of the Interconnection shall make available to the Electric Distribution Company the cleared Day-ahead Energy Market schedules for the DER Aggregation Resources in their territory. During the Operating Day, an Electric Distribution Company may exercise its ability to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource, for purposes of maintaining safe and reliable operation of distribution facilities, pursuant to any applicable tariffs, agreements, and operating procedures of the Electric Distribution Company, and/or the rules and regulations of any Relevant Electric Retail Regulatory Authority. The Electric Distribution Company should communicate the decision to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource directly to the DER Aggregator. Following the exercise of the Electric Distribution Company's override, the DER Aggregator shall reflect the override by updating the applicable bidding parameters of its DER Aggregation Resource. The Office of the Interconnection shall not take any actions to interrupt or interfere with the Electric Distribution Company's decision to override and will re-dispatch the DER Aggregation Resource to reflect its updated bidding parameters.

An Electric Distribution Company's override shall not excuse a DER Aggregator from any financial obligations for failure to perform under Tariff Attachment K-Appendix, Operating Agreement, Schedule 1, or Tariff, Attachment DD, including balancing Operating Reserve and other performance charges, and capacity resource non-performance and test failure charges.

Any disputes regarding an Electric Distribution Company's exercise of its ability to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource, for purposes of maintaining safe and reliable operation of distribution facilities, pursuant to any applicable tariffs, agreements, and operating procedures of the Electric Distribution Company, and/or the rules and regulations of any Relevant Electric Retail Regulatory Authority, shall be addressed in accordance with applicable state or local law, and shall not be arbitrated or in any way resolved by the Office of the Interconnection or through the dispute resolution processes under Operating Agreement, Schedule 5.

(g) The Office of the Interconnection shall not permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model if the applicable DER Aggregation Resource includes Component DER that are end-use customers of an Electric Distribution Company that distributed 4 million MWh or less in the previous fiscal year, as identified by the Electric Distribution Company, unless the Electric Distribution Company determines that the Relevant Electric Retail Regulatory Authority permits such end-use customers to participate. The Office of the Interconnection shall permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model with a DER Aggregation Resource including Component DER that are end-use customers of an Electric Distribution Company that distributed 4 million MWh or less in the previous fiscal year, as identified by the Electric Distribution Company, if, during the course of the registration process described above in Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b), the Electric Distribution Company presents any of the following evidence to PJM:

- i. an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation;
- ii. an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation; or
- iii. an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

The Office of the Interconnection shall permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model if the applicable DER Aggregation Resource includes Component DER that are end-use customers of an Electric Distribution Company that distributed more than 4 million MWh in the previous fiscal year, as identified by the Electric Distribution Company, unless the DER Aggregation Resource includes one or more Component DER that are demand response and the Relevant Electric Retail Regulatory Authority has prohibited the participation of demand response in the DER Aggregator Participation Model, pursuant to the rules set forth in Tariff, Attachment K-Appendix, section 1.5A.3 (1)(a)(i) and Operating Agreement, Schedule 1, section 1.5A.3 (1)(a)(i).

(h) A DER Aggregator may participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model using DER Aggregation Resources containing one or more Component DER that also participate in one or more retail programs. The Office of the Interconnection shall only credit a DER Aggregator for the sale of energy, capacity, and/or ancillary services in PJM markets if one or more of those same services are not also provided as part of a retail program, including but not limited to a Component DER participating in a retail net energy metering program.

A DER Aggregator may participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model using DER Aggregation Resources that provide multiple services in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model. A Component DER shall not be registered with multiple DER Aggregation Resources, or participate as part of another Market Participant outside of the DER Aggregator Participation Model. The Office of the Interconnection shall only credit a DER Aggregator for the sale of energy, capacity, and/or ancillary services in PJM markets if one or more of those same services are not also provided as part of another wholesale sale.

(i) DER Aggregators providing capacity using a DER Capacity Aggregation Resource shall be subject to the Day-ahead Energy Market must-offer requirement described in Tariff, Attachment K-Appendix, section 1.10.1A(d) and Operating Agreement, Schedule 1, section 1.10.1A(d), based on the technology of the Component DER within the DER

Aggregation Resource linked to the DER Capacity Aggregation Resource, in accordance with the PJM Manuals.

(j) DER Aggregation Resources are subject to offer price cap and associated three pivotal supplier test provisions of Operating Agreement, Schedule 1, section 6.4.

(k) A DER Capacity Aggregation Resource shall be subject to a MOPR Floor Offer Price in accordance with the provisions applicable to MOPR Floor Offer Price for Generation Capacity Resources, as described in Tariff, Attachment DD, section 5.14(h-2), and Market Seller Offer Cap for Generation Capacity Resources in a manner consistent with the provisions applicable to Market Seller Offer Cap for Generation Capacity Resources, as described in Tariff, Attachment DD, section 6.4 and Tariff, Attachment M-Appendix, section II.E, based on the underlying technology of the Component DER.

A DER Capacity Aggregation Resource may segment offers for the Component DER subject to mitigation, based on the underlying technology of the Component DER in the DER Capacity Aggregation Resource, and further described in the PJM Manuals.

If a DER Capacity Aggregation Resource is subject to the Minimum Floor Offer Price pursuant to Tariff, Attachment DD, sections 5.14(h-2), the Capacity Market Seller that owns or controls such resources may submit a Sell Offer with a Minimum Floor Offer Price of no lower than the MW-weighted average of the applicable MOPR Floor Offer Prices (zero if not applicable) of the aggregated resources in such Sell Offer.

(l) Projected PJM Market Revenues for DER Capacity Aggregation Resources subject to the Minimum Floor Offer Price or Market Seller Offer Cap shall be determined in accordance with Tariff, Attachment DD, section 6.8(d-1). The determination of PJM Market Revenues by the Market Monitoring Unit or the Office of the Interconnection shall utilize either the hourly output profiles, or the Projected EAS Dispatch, as appropriate

(m) The Office of the Interconnection shall account for and settle a DER Aggregator's DER Aggregation Resource, in the Day-ahead Energy Market and Real-time Energy Market, by summing all load reduction and injection MWh for the underlying Component DER within the Aggregation. The Office of the Interconnection shall calculate the performance of Component DER that have both load reduction and injection capability as follows:

(i) load reduction to 0 MWh shall be calculated in accordance with Tariff, Attachment K-Appendix, sections 1.5A and 3.3A and Operating Agreement, Schedule 1, sections 1.5A and 3.3A;

(ii) injection shall be determined in accordance with the Day-ahead Energy Market and Real-time Energy Market rules as specified in Tariff, Attachment K-Appendix, section 3.1A, and Operating Agreement, Schedule 1, section 3.1A.

(n) Component DER interconnecting to distribution facilities for purposes of participating in the energy, capacity, and/or ancillary services markets of PJM exclusively

through the DER Aggregator Participation Model shall not be subject to the Part IV of the Tariff relating to interconnections with the Transmission System, and shall exclusively interconnect to distribution facilities pursuant to applicable state or local law.

PJM Operating Agreement
Schedule 1, section 1.4B

1.4B DER Aggregator Participation Model

(a) The rules and procedures for the participation of DER Aggregators are established pursuant to this section 1.4B and the PJM Manuals.

(b) In order to participate in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model, a DER Aggregator shall register each DER Aggregation Resource and DER Capacity Aggregation Resource with the Office of the Interconnection, in accordance with the procedures established under the PJM Manuals. For each Component DER in a DER Aggregation Resource, the DER Aggregator shall provide:

- i. Identifying information, including the physical address and Electric Distribution Company account number;
- ii. Metering information, including meter type (e.g., Electric Distribution Company meter, other meter);
- iii. Capability information, including load reduction and injection capability.

The Electric Distribution Company review portion of the registration process shall commence after: (1) the Office of the Interconnection has an executed DER Aggregator Participation Service Agreement on file, to be used for all DER Aggregation Resources associated with the DER Aggregator; and (2) the Office of the Interconnection receives a complete registration from the DER Aggregator, in a form specified in the PJM Manuals.

Upon receipt of a DER Aggregator's completed registration, the Office of the Interconnection shall review the registration and data submitted therein for completeness, and verify that the DER Aggregator meets the eligibility criteria for participation in the DER Aggregator Participation Model, as defined under the PJM Tariff and Operating Agreement and Manuals. The DER Aggregator shall only submit a registration for Component DER that are under contract for the term of the registration, and only one DER Aggregator may operate Component DER at a specific location. The Office of the Interconnection shall notify the appropriate Electric Distribution Company of the DER Aggregator's registration through the appropriate PJM system. A single registration shall only be comprised of individual Component DER in the same state, Electric Distribution Company, Transmission Zone, and pricing point unless otherwise noted below.

The Electric Distribution Company review process shall consist of two periods, in sum not to exceed sixty calendar days. The first shall be a single period, not to exceed fifteen calendar days, during which time the Electric Distribution Company and the Office of the Interconnection shall review and verify each Component DER for which a location was created. The second shall be a single period, not to exceed forty-five calendar days, during which the Electric Distribution Company shall perform a reliability review of the DER Aggregation Resource. In the event that the last day of either the fifteen or forty-five calendar day review period falls on a weekend or holiday, the review period shall conclude on the next business day.

The first fifteen calendar day review period shall commence upon receipt by the Electric Distribution Company of notification from the Office of the Interconnection. Following notification, the Electric Distribution Company may review and verify, as applicable, the Component DER for which a location was created and the following information associated therewith:

- i. The location and data components that represents each Component DER, as further defined in the relevant PJM Manuals, are accurate;
- ii. Participation of the Component DER in an Electric Distribution Company's retail program at the time of registration does not preclude participation of the Component DER in the energy, capacity, and/or ancillary services markets of PJM, and as defined in the PJM Manuals;
 - a. Component DER that participate in a net energy metering retail program may only participate with grid injections in the PJM ancillary services markets, and may not participate with injections in PJM energy or capacity markets, unless:
 1. the Electric Distribution Company confirms to the Office of the Interconnection that participation of the Component DER in a net energy metering retail program or tariff approved by the Relevant Electric Retail Regulatory Authority will not violate the restrictions on duplicative compensation, as described in Tariff, Attachment K-Appendix, section 1.4B(h) and Operating Agreement, Schedule 1, section 1.4B(h); and
 2. the Office of the Interconnection determines that the participation of the Component DER otherwise meets the applicable requirements for energy market or capacity market participation.
 - b. Component DER that participate in a net energy metering retail program that also participate with grid injections in the PJM ancillary services markets shall, based on the information provided by the DER Aggregator or the Electric Distribution Company, be excluded from PJM energy market settlements.
- iii. The Component DER complies with the rules and regulations of any applicable Relevant Electric Retail Regulatory Authority;
- iv. The Relevant Electric Retail Regulatory Authority allows the participation of any applicable Component DER that are also end-use customers of an Electric Distribution Company, in accordance with the provisions of Tariff, Attachment K-Appendix, section 1.4B(g), and Operating Agreement, Schedule 1, section 1.4B(g).

Within the first fifteen calendar day review period, and in coordination with the Office of Interconnection, the Electric Distribution Company shall also assign the electrical node on the PJM Transmission System to each Component DER. The Office of the Interconnection shall ensure that any information regarding Component DER that the Office of the Interconnection receives from an Electric Distribution Company or a DER Aggregator is accessible to both the Electric Distribution Company and the DER Aggregator.

Following approval of the Component DER by the Electric Distribution Company and the Office of the Interconnection, the DER Aggregator shall designate DER Aggregation Resources comprising of one or more of the approved Component DER. The second forty-five calendar day review period shall commence upon receipt by the Electric Distribution Company of notification of such designation by the DER Aggregator, from the Office of the Interconnection whereby the Electric Distribution Company shall review the DER Aggregation Resource and verify that the participation of the DER Aggregation Resource in the PJM energy, capacity, and/or ancillary service markets does not pose a threat to the reliable and safe operation of the distribution system, the public, or Electric Distribution Company personnel. The scope of the Electric Distribution Company review of distribution system reliability impacts shall be limited to any incremental impacts arising from a Component DER participation in a DER Aggregation Resource that were not previously considered by the Electric Distribution Company during the interconnection study process for that Component DER.

If the Electric Distribution Company identifies concerns during the Electric Distribution Company review portion of the registration process, the Electric Distribution Company may notify the Office of the Interconnection and the DER Aggregator, and the Electric Distribution Company and the DER Aggregator may first attempt to resolve those concerns bilaterally, or in accordance with applicable state or local law, prior to seeking initiation of the dispute resolution process described in Operating Agreement, Schedule 5. Issues within disputes that the Office of the Interconnection determines solely concern the application of any applicable tariffs, agreements, and operating procedures of the Electric Distribution Company, and/or the rules and regulations of any Relevant Electric Retail Regulatory Authority, shall be addressed in accordance with applicable state or local law, and shall not be arbitrated or in any way resolved by the Office of the Interconnection or through the dispute resolution processes under Operating Agreement, Schedule 5. Issues within disputes that the Office of the Interconnection determines concern the provisions of the PJM Governing Agreements may be arbitrated under the dispute resolution processes under Operating Agreement, Schedule 5.

In the event that the Electric Distribution Company's concerns are resolved within the Electric Distribution Company review portion of the registration process, the Electric Distribution Company may recommend that the Office of the Interconnection approve the location and/or registration, as applicable. In the event that the concerns identified by the Electric Distribution Company are not resolved, the Electric Distribution Company may, within the Electric Distribution Company review portion of the registration process, recommend that the Office of the Interconnection: (i) reject the location and/or registration, (ii) approve the registration with certain operational limitations on the DER Aggregation Resource identified in the registration, or

(iii) approve the registration with the removal of one or more specific Component DER from the DER Aggregation Resource identified in the registration.

Following the Electric Distribution Company's review of the DER Aggregation Resource registration, within fifteen calendar days, the Office of the Interconnection shall apply the applicable pricing points to the DER Aggregation Resource, and shall either approve or deny the DER Aggregator's registration based on the Office of the Interconnection's review of the registration and receipt and review of the Electric Distribution Company's comments and recommendation, with deference given to the Electric Distribution Company's assessment of the impact of the DER Aggregator's registration on the safety and reliability of distribution facilities. To the extent that no comments or recommendations are provided by the Electric Distribution Company, including after the Office of the Interconnection provides final notice to the Electric Distribution Company prior to the expiration of the Electric Distribution Company review portion of the registration process, the Office of the Interconnection shall approve the DER Aggregator's registration.

All DER Aggregators shall remain in full compliance with the tariffs, agreements, and operating procedures of the applicable Electric Distribution Company, and the rules and regulations of any Relevant Electric Retail Regulatory Authority, in accordance with their executed DER Aggregator Participation Service Agreement, at all times while participating in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model.

Transmission Owners shall, in coordination with the Office of the Interconnection, provide all data to the Office of the Interconnection reasonably required to accurately represent the DER Aggregation Resource in the Regional Transmission Expansion Plan, in accordance with Operating Agreement, section 1.5.4 and the PJM Manuals.

A DER Aggregator shall report to the Office of the Interconnection any proposed update to the inventory of the individual Component DER within the DER Aggregation Resource, or proposed additional market services provided by the DER Aggregation Resource, identified in the DER Aggregator's registration to reflect any proposed addition or subtraction of a Component DER or market service, and any applicable information or data associated with the Component DER or market service, in accordance with the specifications described in the PJM Manuals. Any proposed update shall not require a new registration of the existing Component DER within the approved DER Aggregation Resource. Upon the Electric Distribution Company's receipt of notification of any proposed update, including all applicable information or data, the host Electric Distribution Company shall have an opportunity to conduct a review, for the first fifteen calendar day and/or second forty-five calendar day review period, in accordance with the provisions of this section related to initial registration, and make a recommendation to the Office of the Interconnection, prior to the Office of the Interconnection approving or denying the proposed update to the DER Aggregation Resource. The DER Aggregator may continue to participate in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model using its existing approved DER Aggregation Resource during the course of any such review conducted by the Electric Distribution Company. An inventory of the individual Component DER within a DER Aggregation Resource registration that is linked to

a DER Capacity Aggregation Resource may not be modified during the course of an applicable Delivery Year.

(c) All Component DER in a DER Aggregation Resource shall interface with the same primary pricing node, except: (i) in the case of a DER Aggregation Resource that only provides ancillary services and is less than or equal to 5 MW, the Component DER within the DER Aggregation Resource may interface with multiple primary pricing nodes, so long as those primary pricing nodes are in the same state, service territory of a single Electric Distribution Company and Transmission Zone; and (ii) in the case of a DER Aggregation Resource utilizing the limited multi-nodal aggregation participation option described below, so long as those primary pricing nodes are in the same state, service territory of a single Electric Distribution Company and Transmission Zone, and meet the criteria defined below and in the PJM Manuals; and (iii) in the case of a DER Capacity Aggregation Resource, the Component DER within a DER Aggregation Resource(s) linked to the DER Capacity Aggregation Resource may interface with multiple primary pricing nodes, so long as those primary pricing nodes are located within a defined zone or sub-zonal Locational Deliverability Area.

The purpose of participating under the limited multi-nodal aggregation option is to allow the participation of Component DER in the energy market that cannot form aggregations at a single primary pricing node at the minimum capability criteria of 0.1 MW. To participate, the multi-nodal DER Aggregation Resource may be comprised of one or more Component DER with capability smaller than 0.1 MW. Component DER at a single primary node with capability greater than 0.1 MW shall be excluded from participation in the multi-nodal DER Aggregation Resource unless the total capability of all other Component DER in a DER Aggregation Resource is below the 0.1 MW participation threshold, as further described in the PJM Manuals. The multi-nodal DER Aggregation Resource shall also be self-scheduled into the PJM energy markets. The megawatt participation cap on the multi-nodal aggregation participation option shall be set to 167 MW within the PJM Region. The Office of the Interconnection shall conduct an assessment of the 167 MW cap upon penetration of DER Aggregation Resources participating in the limited multi-nodal aggregation option exceeding ninety percent of the 167 MW cap value. The Office of the Interconnection shall establish a periodic review, in coordination with the Electric Distribution Company and DER Aggregator, no less than annually, or more frequently as needed, to identify any permanent electrical location change that would modify the pricing node associated with a DER Aggregation Resource or its underlying Component DER. During this review, the Office of the Interconnection shall: (i) confirm that applicable data reviewed and verified in the registration process is still complete and accurate, and (ii) request any updates to such data as a condition of continued participation in the DER Aggregator Participation Model.

(d) A DER Aggregator shall self-schedule their DER Aggregation Resource into the PJM Day-ahead Energy Market and Real-time Energy Market based on bidding parameters for the applicable technology-type, as described in the PJM Manuals. A DER Aggregator shall be eligible, at their election, to offer a dispatchable range in submitting bidding parameters into the Day-ahead Energy Market and Real-time Energy Market.

(e) A DER Aggregator shall be responsible for dispatching the underlying Component DER within a DER Aggregation Resource in accordance with the Office of the

Interconnection's dispatch instructions for the DER Aggregation Resource, unless the DER Aggregator elects to designate another entity to dispatch the Component DER. A DER Aggregator shall provide telemetry for each DER Aggregation Resource participating in the energy, capacity, and/or ancillary services markets of PJM through the DER Aggregator Participation Model, in accordance with the technical specifications described in the PJM Manuals. A DER Aggregator may provide telemetry for the individual Component DER within a DER Aggregation Resource. This telemetry shall represent one or more values indicative of the total electrical output of the DER Aggregation Resource and inclusive of all underlying Component DER. This telemetry requirement shall not apply to a DER Aggregation Resource exclusively participating in the energy market that is less than 10 MW, notwithstanding the technical specifications described in the PJM Manuals.

A DER Aggregator shall provide to the Office of the Interconnection all individual Component DER meter data necessary to facilitate the settlement of the DER Aggregator's DER Aggregation Resource, in accordance with Operating Agreement, section 14 and the PJM Manuals. A DER Aggregator shall retain performance data for individual Component DER in a DER Aggregation Resource for auditing purposes, in accordance with the PJM Manuals. A DER Aggregator is responsible for ensuring that Component DER within a DER Aggregation Resource have metering equipment that provides integrated hourly kWh values on an Electric Distribution Company account basis. For non-interval metered residential DER Aggregation Resources, the DER Aggregator must ensure that a representative sample of Component DER have metering equipment that provides integrated hourly kWh values on an Electric Distribution Company account basis, as set forth in the PJM Manuals. For DER Aggregation Resources containing Component DER that are mass market customers, DER Aggregators shall provide aggregated meter data to the Office of the Interconnection for the settlement of the DER Aggregator's DER Aggregation Resource. Meter data shall be submitted by the DER Aggregator to the Office of Interconnection within one business day.

The DER Aggregator shall ensure that the metering equipment for settlement has a maximum error of two percent over the full range of the metering equipment (including potential transformers and current transformers) and the metering equipment, metering configurations and associated data meets the requirements set forth herein and in the PJM Manuals.

(f) The Electric Distribution Company should, prior to the deadline for submission of offers into the Day-ahead Energy Market, as described in Tariff, Attachment K-Appendix, section 1.10.1A and Operating Agreement, Schedule 1, section 1.10.1A, notify the DER Aggregator of any operational limitations for the Operating Day that may impact the bidding parameters of an applicable DER Aggregation Resource. In the event that the Electric Distribution Company identifies additional operational concerns after the deadline described in Tariff, Attachment K-Appendix, section 1.10.1A and Operating Agreement, Schedule 1, section 1.10.1A, the DER Aggregator may utilize the generation rebidding period identified in Tariff, Attachment K-Appendix, section 1.10.9, and Operating Agreement, Schedule 1, section 1.10.9, to update its bidding parameters.

During the Operating Day, the Office of the Interconnection shall dispatch the DER Aggregation Resource, in accordance with the DER Aggregator's submitted bidding parameters. The Office

of the Interconnection shall make available to the Electric Distribution Company the cleared Day-ahead Energy Market schedules for the DER Aggregation Resources in their territory. During the Operating Day, an Electric Distribution Company may exercise its ability to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource, for purposes of maintaining safe and reliable operation of distribution facilities, pursuant to any applicable tariffs, agreements, and operating procedures of the Electric Distribution Company, and/or the rules and regulations of any Relevant Electric Retail Regulatory Authority. The Electric Distribution Company should communicate the decision to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource directly to the DER Aggregator. Following the exercise of the Electric Distribution Company's override, the DER Aggregator shall reflect the override by updating the applicable bidding parameters of its DER Aggregation Resource. The Office of the Interconnection shall not take any actions to interrupt or interfere with the Electric Distribution Company's decision to override and will re-dispatch the DER Aggregation Resource to reflect its updated bidding parameters.

An Electric Distribution Company's override shall not excuse a DER Aggregator from any financial obligations for failure to perform under Tariff Attachment K-Appendix, Operating Agreement, Schedule 1, or Tariff, Attachment DD, including balancing Operating Reserve and other performance charges, and capacity resource non-performance and test failure charges.

Any disputes regarding an Electric Distribution Company's exercise of its ability to override the physical operation of a DER Aggregation Resource or individual Component DER within a DER Aggregation Resource, for purposes of maintaining safe and reliable operation of distribution facilities, pursuant to any applicable tariffs, agreements, and operating procedures of the Electric Distribution Company, and/or the rules and regulations of any Relevant Electric Retail Regulatory Authority, shall be addressed in accordance with applicable state or local law, and shall not be arbitrated or in any way resolved by the Office of the Interconnection or through the dispute resolution processes under Operating Agreement, Schedule 5.

(g) The Office of the Interconnection shall not permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model if the applicable DER Aggregation Resource includes Component DER that are end-use customers of an Electric Distribution Company that distributed 4 million MWh or less in the previous fiscal year, as identified by the Electric Distribution Company, unless the Electric Distribution Company determines that the Relevant Electric Retail Regulatory Authority permits such end-use customers to participate. The Office of the Interconnection shall permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model with a DER Aggregation Resource including Component DER that are end-use customers of an Electric Distribution Company that distributed 4 million MWh or less in the previous fiscal year, as identified by the Electric Distribution Company, if, during the course of the registration process described above in Tariff, Attachment K-Appendix, section 1.4B(b) and Operating Agreement, Schedule 1, section 1.4B(b), the Electric Distribution Company presents any of the following evidence to PJM:

- i. an order, resolution or ordinance of the Relevant Electric Retail Regulatory Authority permitting or conditionally permitting the end-use customer's participation;
- ii. an opinion of the Relevant Electric Retail Regulatory Authority's legal counsel attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation; or
- iii. an opinion of the state Attorney General, on behalf of the Relevant Electric Retail Regulatory Authority, attesting to the existence of a regulation or law permitting or conditionally permitting the end-use customer's participation.

The Office of the Interconnection shall permit a DER Aggregator to participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model if the applicable DER Aggregation Resource includes Component DER that are end-use customers of an Electric Distribution Company that distributed more than 4 million MWh in the previous fiscal year, as identified by the Electric Distribution Company, unless the DER Aggregation Resource includes one or more Component DER that are demand response and the Relevant Electric Retail Regulatory Authority has prohibited the participation of demand response in the DER Aggregator Participation Model, pursuant to the rules set forth in Tariff, Attachment K-Appendix, section 1.5A.3 (1)(a)(i) and Operating Agreement, Schedule 1, section 1.5A.3 (1)(a)(i).

(h) A DER Aggregator may participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model using DER Aggregation Resources containing one or more Component DER that also participate in one or more retail programs. The Office of the Interconnection shall only credit a DER Aggregator for the sale of energy, capacity, and/or ancillary services in PJM markets if one or more of those same services are not also provided as part of a retail program, including but not limited to a Component DER participating in a retail net energy metering program.

A DER Aggregator may participate in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model using DER Aggregation Resources that provide multiple services in the PJM energy, capacity, and/or ancillary services markets through the DER Aggregator Participation Model. A Component DER shall not be registered with multiple DER Aggregation Resources, or participate as part of another Market Participant outside of the DER Aggregator Participation Model. The Office of the Interconnection shall only credit a DER Aggregator for the sale of energy, capacity, and/or ancillary services in PJM markets if one or more of those same services are not also provided as part of another wholesale sale.

(i) DER Aggregators providing capacity using a DER Capacity Aggregation Resource shall be subject to the Day-ahead Energy Market must-offer requirement described in Tariff, Attachment K-Appendix, section 1.10.1A(d) and Operating Agreement, Schedule 1, section 1.10.1A(d), based on the technology of the Component DER within the DER

Aggregation Resource linked to the DER Capacity Aggregation Resource, in accordance with the PJM Manuals.

(j) DER Aggregation Resources are subject to offer price cap and associated three pivotal supplier test provisions of Operating Agreement, Schedule 1, section 6.4.

(k) A DER Capacity Aggregation Resource shall be subject to a MOPR Floor Offer Price in accordance with the provisions applicable to MOPR Floor Offer Price for Generation Capacity Resources, as described in Tariff, Attachment DD, section 5.14(h-2), and Market Seller Offer Cap for Generation Capacity Resources in a manner consistent with the provisions applicable to Market Seller Offer Cap for Generation Capacity Resources, as described in Tariff, Attachment DD, section 6.4 and Tariff, Attachment M-Appendix, section II.E, based on the underlying technology of the Component DER.

A DER Capacity Aggregation Resource may segment offers for the Component DER subject to mitigation, based on the underlying technology of the Component DER in the DER Capacity Aggregation Resource, and further described in the PJM Manuals.

If a DER Capacity Aggregation Resource is subject to the Minimum Floor Offer Price pursuant to Tariff, Attachment DD, sections 5.14(h-2), the Capacity Market Seller that owns or controls such resources may submit a Sell Offer with a Minimum Floor Offer Price of no lower than the MW-weighted average of the applicable MOPR Floor Offer Prices (zero if not applicable) of the aggregated resources in such Sell Offer.

(l) Projected PJM Market Revenues for DER Capacity Aggregation Resources subject to the Minimum Floor Offer Price or Market Seller Offer Cap shall be determined in accordance with Tariff, Attachment DD, section 6.8(d-1). The determination of PJM Market Revenues by the Market Monitoring Unit or the Office of the Interconnection shall utilize either the hourly output profiles, or the Projected EAS Dispatch, as appropriate

(m) The Office of the Interconnection shall account for and settle a DER Aggregator's DER Aggregation Resource, in the Day-ahead Energy Market and Real-time Energy Market, by summing all load reduction and injection MWh for the underlying Component DER within the Aggregation. The Office of the Interconnection shall calculate the performance of Component DER that have both load reduction and injection capability as follows:

(i) load reduction to 0 MWh shall be calculated in accordance with Tariff, Attachment K-Appendix, sections 1.5A and 3.3A and Operating Agreement, Schedule 1, sections 1.5A and 3.3A;

(ii) injection shall be determined in accordance with the Day-ahead Energy Market and Real-time Energy Market rules as specified in Tariff, Attachment K-Appendix, section 3.1A, and Operating Agreement, Schedule 1, section 3.1A.

(n) Component DER interconnecting to distribution facilities for purposes of participating in the energy, capacity, and/or ancillary services markets of PJM exclusively

through the DER Aggregator Participation Model shall not be subject to the Part IV of the Tariff relating to interconnections with the Transmission System, and shall exclusively interconnect to distribution facilities pursuant to applicable state or local law.