PJM Interconnection, L.L.C.
2750 Monroe Blvd.
Audubon, PA 19403-2497

Chenchao Lu
Counsel
T: (610) 666-2255 | F: (610) 666-8211
Chenchao.Lu@pjm.com

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

Re: *PJM Interconnection L.L.C., Docket No. ER19-1012-001*
Responses to Deficiency Letter re: Price Response Demand Update

Dear Secretary Bose:

PJM Interconnection, L.L.C. ("PJM") hereby responds to the letter of the Federal Energy Regulatory Commission's ("Commission") Office of Energy Market Regulation issued on March 29, 2019[1] seeking additional information concerning the filing it submitted on February 7, 2019.[2] PJM appreciates the opportunity to further clarify the proposed revisions.

I. PROPOSED CHANGES TO PJM'S GOVERNING DOCUMENTS

As further explained in the responses below, PJM proposes additional revisions to PJM's Open Access Transmission Tariff ("Tariff") and the Reliability Assurance Agreement Among Load Serving Entities in the PJM Region ("RAA"), and would be amenable to filing such changes in a subsequent compliance filing, that will clarify the proposed Price Responsive Demand[3] ("PRD") rules.[4] In addition, given that the outcome of PJM's proposed Peak Shaving

[1] *PJM Interconnection, L.L.C.*, Deficiency Letter, Docket No. ER19-1012-000 (March 29, 2019) ("Deficiency Letter").

[2] *PJM Interconnection, L.L.C.*, Transmittal Letter, Docket No. ER19-1012-000 (February 7, 2019) ("PJM Transmittal").

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

Adjustment filing remains uncertain,[5] PJM also seeks to amend, in a subsequent Commission directed compliance filing, the proposed dates for PRD Providers to withdraw or modify PRD Plans one week prior to the commencement of the 2019 Base Residual Auction.[6] Lastly, PJM is amending the proposed effective date for this filing to July 28, 2019.

II. RESPONSE TO DEFICIENCY LETTER

1. *In your filing, you explain that the existing PRD rules have remained largely unchanged since PRD was first implemented in 2012, despite the fact that PJM implemented new requirements known as Capacity Performance for other capacity market resources beginning in 2015.[7] Further, you state in your filing that PJM is aligning the rules and requirements for PRD with those of Capacity Performance to "[avoid] any arbitrage opportunities when the same customer will reduce load either from the supply or demand side."[8]*

    a. *Is there new reasoning, that did not exist when PJM first implemented Capacity Performance, for the current decision to align the requirements for PRD with the requirements for Capacity Performance Resources?*

PJM Answer

PRD was first implemented prior to the existence of Capacity Performance. When PJM proposed to implement Capacity Performance, no Market Participant had submitted any PRD Plans. It was not until 2017 when PJM first received and approved PRD Plans for the 2020/2021 Delivery Year. As a result, at the time of PJM's Capacity Performance filing, PRD was

[4] PJM proposes to adopt suggested changes in this deficiency response as part of a compliance order rather than submit revised changes in this response because RAA, section 16.4 requires the PJM Board to approve any changes. In order to submit these deficiency responses in a timely manner, PJM will seek approval of the suggested changes by the PJM Board at the next scheduled PJM Board meeting and requests the Commission direct PJM to file a subsequent compliance filing with the requested revisions.

[5] See PJM Transmittal Letter, Peak Shaving Adjustment Proposal, Docket No. ER19-511-001.

[6] PJM originally proposed to allow PRD Providers to withdraw or modify PRD Plans no later than 14 days prior to the posting of the planning parameters, which PJM intends to post by May 1, 2019. Since an order on this filing is no longer expected until June, 2019, in the event this filing is accepted, it is necessary to revise the PRD withdrawal/modification date to allow PRD Providers sufficient time to withdraw or modify any previously submitted PRD Plans under the existing rules.

[7] PJM Transmittal at 3-4 (citing *PJM Interconnection, L.L.C.*, 139 FERC ¶ 61,115 (2012) (PRD Order), *PJM Interconnection, L.L.C.*, 151 FERC ¶ 61,208 (2015) (Capacity Performance Order)).

[8] PJM Transmittal at 6.

inadvertently omitted from the filing partly due to the fact that there was no active PRD participation at the time. Since 2017, however, PJM has received and approved PRD Plans for each subsequent relevant Delivery Year. This change prompted PJM to review the workings of the PRD rules in light of the Capacity Performance requirements and seek to align the PRD with those requirements.

b. Please explain, using one or two examples, what arbitrage opportunities PJM hopes to avoid through the instant filing and whether these opportunities were previously not a concern or were unknown to PJM.

PJM Answer

PJM clarifies that the arbitrage opportunities refers to the undue preferential treatment that certain resources receive compared to all other Capacity Performance Resources. Specifically, without implementation of the proposed PRD rules, certain demand response resources that do not meet Capacity Performance requirements would be compensated as if they were Capacity Performance Resources today. Such resources would be effectively treated and qualify as Capacity Performance Resources despite not meeting the requisite Capacity Performance capabilities. These opportunities should not exist under the Capacity Performance construct because resources that do not meet Capacity Performance requirements would be over-compensated and allowed to replace Capacity Performance Resources, which ultimately increases risk to the system.

2. In your filing, you state that PJM proposes to require PRD to be available to reduce load year-round by changing how the Nominal PRD Value is calculated. Specifically, PJM proposes to replace the current determination of Nominal PRD Value as "the difference between the PRD Provider's Zonal Expected Peak Load Value of PRD and the Maximum Emergency Service Level of Price Responsive Demand"[9] with "the lesser of (a) peak load contribution minus (summer Firm

[9] PJM, Intra-PJM Tariffs, RAA, Schedule 6.1.C.

Service Level times loss factor) or (b) (Winter Peak Load multiplied by Zonal Winter Weather Adjustment Factor minus winter Firm Service Level) times loss factor."[10]

a. Please define "peak load contribution," and explain how it is currently used in PJM billing and settlements. Is this term defined in the RAA or another Commission-jurisdictional PJM governing document? How is "peak load contribution" as given in the proposed revision distinct from the term "PRD Provider's Zonal Expected Peak Load Value of PRD" defined in the RAA and used in the current calculation of Nominal PRD Value?

PJM Answer

The peak load contribution of an end-use customer represents an end-use customer's share of the zonal weather normalized peak load for the prior summer. Peak load contribution's use in PJM billing and settlements for PRD are described in RAA, Schedule 8.[11] An Electric Distribution Company ("EDC") is responsible for determining the peak load contributions of end-use customers in its Zone. Each EDC may have a different methodology for determining the peak load contributions of end use customers.[12] The aggregate of the peak load contributions of the end-use customers that a Load Serving Entity serves in the Zone in the Delivery Year becomes the basis for a Load Serving Entity's Obligation Peak Load in the Zone, which is used to calculate the Load Serving Entity's daily unforced capacity obligation in the Zone.

Currently, the PRD Provider's Zonal Expected Peak Load Value is defined as the PRD Provider's expected contribution to the Delivery Year forecasted summer peak load if the PRD

[10] PJM Transmittal at 6.

[11] RAA, Schedule 8 explains that the Daily Unforced Capacity Obligation is calculated with the "the weather adjusted coincident summer peak, last preceding the Delivery Year, of the end-users in such Zone," which is equivalent to peak load contribution. RAA, Article 7, section 2 further explains that the Locational Reliability Charge is equal to the Daily Unforced Capacity Obligation in a Zone, times the Final Zonal Capacity Price for such Zone.

[12] See Tariff, Attachment M-2; see also PLC Methodology Inventory, available at: https://www.pjm.com/markets-and-operations/billing-settlements-and-credit/theo-plc-and-nspl.aspx

did not reduce in response to price. At the time of the PRD Plan submission (which must be submitted no later than January 15 before the Base Residual Auction for the Delivery Year that the PRD is to be committed),[13] the PRD Provider's Zonal Expected Peak Load Value is estimated by adjusting the most recent peak load contributions (which are based on data from summer prior to the PRD Plan submittal) by four year's load growth to determine the PRD Provider's expected contribution to the Delivery Year forecasted summer peak load. At the time of PRD registration (which must be submitted at least one day before the tenth business day prior to the start date that a PRD registration is effective),[14] the PRD Provider's Expected Peak Load Value for a registration is determined by adjusting the most recent peak load contribution for the registration (which is based on data from summer prior to the Delivery Year) by one year of load growth to determine the PRD Provider's Expected Peak Load Value for such registration.

In this filing, PJM's proposes to eliminate the PRD Provider's Zonal Expected Peak Load Value in the calculation of the Nominal PRD Value and replace it with the use of peak load contribution or Winter Peak Load so that the method to calculate load reduction for PRD is consistent with the method to determine the load reduction for Demand Resources, which are Capacity Performance Resources. This proposed change is appropriate because the PRD Provider's Zonal Expected Peak Load Value is based only on data from the summer period, which ignores performance in the winter to the extent it is less than performance in non-winter periods as captured in peak load contribution. Capturing performance in the winter (if it is lesser than performance in non-winter) is necessary to align PRD with the Capacity Performance construct.

[13] RAA, Schedule 6.1.C.

[14] PJM Manual 18: PJM Capacity Market, §3A.5 (rev. 41 Jan. 1, 2019), https://www.pjm.com/-/media/documents/manuals/m18.ashx

b. Please define "loss factor." Is this term defined in the RAA or another Commission-jurisdictional PJM governing document? Please provide representative loss factors for various Electric Distribution Companies (EDCs) in the PJM region that illustrate the range of possible values.

PJM Answer

Loss Factor represents the transmission and distribution losses when converting retail load to transmission/generation level load. The same exact loss factors are also used in the Demand Response process.[15] The loss factor is determined by the relevant Transmission Owner and provided to PJM. The loss factors themselves remain unique to each transmission and distribution system and reflect the topology and loads of that particular system. As a result, there is no centralized determination of loss factor set forth in the governing documents. However, loss factors for some systems are specified in the Tariff. For instance, in the FirstEnergy Zones, the charts below, which are found in Tariff Attachment M-1, illustrate the range of possible loss factors:

Service Voltage	ATSI Ohio	Penn Power	Met-Ed	Penelec	JCP&L
Transmission Load	1.01486	1.01486	1.02100	1.04070	1.03900
Subtransmission Source	1.02786	1.02786			
Subtransmission Load	1.02886	1.02886			
Primary Load	1.05786	1.05786	1.03740	1.06060	1.06100
Secondary Load	1.09486	1.08960	1.07180	1.09450	1.11800

Service Voltage	West Penn Power	Potomac Edison MD	Potomac Edison WV	Mon Power
Transmission Load	1.02184	1.02245	1.02245	1.02233
Subtransmission Source			1.02646	
Subtransmission w/Tran Charge	1.04282			
Subtransmission Load	1.03578	1.03742	1.03807	1.03390
Primary Source			1.03070	1.03378
Primary Load	1.06383	1.07542	1.07691	1.06071
Secondary Load	1.09434	1.09513	1.09705	1.09033

[15] See RAA, Schedule 6, section I.

c. PJM defines a single capitalized term Firm Service Level in its proposed revision. This could imply that a PRD Provider designates a single Firm Service Level for the entire year. At the same time, PJM uses the terms "summer Firm Service Level" and "winter Firm Service Level," which could imply that a PRD Provider can specify two different Firm Service Levels for summer and winter. Please clarify whether or not a PRD Provider has the option to specify a different summer Firm Service Level and winter Firm Service Level.

PJM Answer

A PRD Provider has the option to specify a different summer Firm Service Level and winter Firm Service Level. This is identical to the process used for Demand Resources that also commit to reduce load for the wholesale market.[16]

d. It appears that PJM replaced the existing "PRD Maximum Emergency Service Level" with the term "Firm Service Level." Please explain the difference between the two terms.

PJM Answer

As defined in RAA, Article 1, the Maximum Emergency Service Level ("MESL") is the level at which the price-responsive load will be reduced during the Delivery Year when a Maximum Generation Emergency is declared.[17] The quantity of load that will be consumed at a price equal to the applicable energy market offer cap for the relevant Delivery Year represents the MESL. The locational MESL quantities (at substation/sub-zonal/zonal) will be aggregated to determine the Zone/LDA MESL quantity for the PRD Provider in such Zone/LDA.

The summer or winter Firm Service Level ("FSL") is the level to which the price-responsive load will be reduced during the Delivery Year when an Emergency Action triggers a Performance Assessment Interval during the relevant summer or winter period. The summer period is June through October and May of the Delivery Year. The winter period is November

[16] See RAA, Schedule 6.

[17] See RAA, Article 1

through April of the Delivery Year. The quantity of summer or winter load that will be consumed at a price equal to the applicable energy market offer cap for the relevant Delivery Year represents the respective summer or winter FSL. The locational summer or winter FSL quantities (at substation/sub-zonal/zone) will be aggregated to determine the Zone/LDA summer/winter FSL quantity for the PRD Provider in such zone/LDA.

Both the current use of MESL and the proposed use of FSL represent the demand level (in MWs) to which price-responsive load is expected to reduce to during an emergency procedure that triggers an evaluation of performance. In addition, both MESL and FSL values are determined based on the load to be consumed at the energy market offer cap. The difference is that a different level can be specified for the summer period and the winter period for FSL. In contrast, the MESL was a single value for the entirety of the Delivery Year. For the reasons set forth in the initial filing as explained herein, PJM proposes to switch to use of FSL because it allows PJM to account for annual performance in a manner that is comparable to how it measures performance for all other Capacity Performance Resources.

3. *In your filing, you propose to change the trigger for PRD performance verification (and possible non-performance charges) from a "maximum emergency event" to a Performance Assessment Interval.*[18]

   a. *The current RAA initiates PRD performance verification during a "maximum emergency event,"*[19] *which is not a defined term in PJM's Commission-jurisdictional governing documents, but the instant filing states that, under PJM's existing rules, PRD Providers are required to demonstrate performance during a Maximum Generation Emergency, which is a defined term in the PJM OATT.*[20] *Please explain the difference, if any, between a "maximum emergency event" and Maximum Generation Emergency.*

[18] PJM Transmittal at 6-9.

[19] PJM, Intra-PJM Tariffs, RAA, Schedule 6.1 § J (2.0.0).

[20] PJM Transmittal at n.16.

PJM Answer

There is no intended difference between a maximum emergency event and Maximum Generation Emergency. Given that the existing "maximum emergency event" language in the RAA is not a defined term, PJM proposed to replace the term with the Tariff defined term "Maximum Generation Emergency" in the PJM Transmittal. This ensures consistent use of the term "Maximum Generation Emergency," which has the same meaning as the previously used term "maximum emergency event."

b. Please explain the difference between the PJM-defined terms Maximum Generation Emergency, Emergency Action (which triggers a Performance Assessment Interval), Emergency Condition, and "emergency conditions" and "pre-emergency conditions" as defined for Emergency and Pre-Emergency Load Response Programs.[21] *Please explain how each of these are related to each other and to NERC-specified Energy Emergency Alerts.*

PJM Answer

An Emergency Action is a defined term in the Tariff as "any emergency action for locational or system-wide capacity shortages that either utilizes pre-emergency mandatory load management reductions or other emergency capacity, or initiates a more severe action including, but not limited to, a Voltage Reduction Warning, Voltage Reduction Action, Manual Load Dump Warning, or Manual Load Dump Action."[22] These actions are used by PJM to manage the system during locational or system-wide capacity shortages.

A Maximum Generation Emergency is one of the Emergency Actions that may be deployed to address a system issue and represents the maximum net electrical power that a

[21] *See* PJM, Intra-PJM Tariffs, OATT, Attachment K Appendix § 8.5 (2.0.0) ("For the purposes of Section 8, emergency conditions shall be defined either by the express terms of the Applicable Law or Regulation, or if not set forth therein shall be deemed to exist if PJM has declared a NERC Energy Emergency Alert Level 2, as defined in the applicable NERC Standards.").

[22] Tariff, section 1.

generator can deliver for a limited period of time without exceeding specified limits of equipment stress. PJM declares a Maximum Generation Emergency Action and begins to load Maximum Emergency generation or purchase available emergency energy from PJM Members (Emergency Bid Process) and from neighboring Control Areas based on economics and availability.

An Emergency Condition is also a defined term in the Tariff and represents a situation where significant damage to the grid has occurred or is expected to occur.[23] Emergency Actions are taken in response to Emergency Conditions. PJM issues Energy Emergency Alerts ("EEA") in accordance with NERC standard EOP-011 to ensure that all Reliability Coordinators understand the Emergency Conditions within PJM.[24]

Emergency and Pre-Emergency Load response are also specific Emergency Actions. Emergency and Pre-Emergency Load Response Program and associated conditions are defined in Tariff, section 8.1. Pre-Emergency Load Response is typically deployed prior to Maximum Generation Emergency when economic resources are not adequate to serve load and maintain reserves or maintain system reliability. Emergency Load Response is deployed under the same conditions but typically after Pre-Emergency Load Response and when a NERC EEA Level 2 has been issued.

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[23] Tariff, Part 1.

[24] The EEAs are issued in conjunction with the following PJM Emergency Procedures:

PJM will issue an EEA Level 1 day ahead in conjunction with the issuance of a Maximum Generation Emergency or Load Management Alert .

EEA Level 1 issued in real time (if not day ahead) before or concurrent with Pre-Emergency Demand Response.

EEA Level 2 issued in real time if Emergency Demand Response is required (or more severe Emergency Procedures).

EEA Level 3 issued in real time if a Voltage Reduction is issued and PJM is unable to meet minimum Contingency Reserve Requirements. Otherwise an EEA2 is issued.

EEA Level 3 issued in real time for Manual Load Dump Warning.

c. *Noting that PJM has previously documented historical emergency procedures dating back to June 1, 2005,*[25] *please provide historic data spanning June 1, 2005 to the present day on the frequency and duration of "maximum emergency events" and Emergency Actions (which trigger Capacity Performance Resource Performance Assessment Intervals).*

PJM Answer

As noted above in response to question 3.a, a maximum emergency event is the same as Maximum Generation Emergency. The historical data that contains the frequency and duration of Maximum Generation Emergencies and Emergency Actions is available at:

https://www.pjm.com/-/media/committees-groups/committees/elc/postings/historical-performance-assessment-hours.ashx?la=en.

In the historical data file, Maximum Generation Emergencies are listed as "Max Emerg Gen" or "Max Emerg Gen Action Trans" in the message type. All Emergency Actions are also included on this same list.

4. *In your filing, you propose to add the following language to RAA Schedule 6.1 regarding compliance measurement for PRD registrations:*

For the 2022/2023 Delivery Year and subsequent Delivery Years, a PRD Provider is subject to a Non-Performance Assessment in accordance with the PJM Tariff, Attachment DD, section 10A. Compliance is measured for a PRD registration upon declaration of a Performance Assessment Interval in same sub-Zone/Zone of such PRD registration and when the PRD Curve associated with such registration in the PJM Real-time Energy Market has a price point at or below the highest Real-time LMP recorded during the Performance Assessment Interval at the associated pricing point.[26]

You also propose to add the following similar language to OATT Attachment DD, section 10A:

. . . a Price Responsive Demand registration shall not be considered in the calculation of a Performance Shortfall for a Performance Assessment Interval when the PRD Curve associated with such registration in the PJM Real-time

[25] PJM Interconnection, L.L.C., *Historical Performance Assessment Hours* (Nov. 2015), https://www.pjm.com/committees-and-groups/committees/elc.aspx.

[26] PJM Transmittal at 10.

Energy Market has a price point above the highest real-time LMP recorded during the Performance Assessment Interval.[27]

a. The proposed RAA language includes "…at the associated pricing point," while the proposed OATT language does not. Please explain the meaning of "at the associated pricing point," and why this language is included in the RAA revision but not the OATT revision. Specifically, please explain if "at the associated pricing point" refers to a price point on the PRD Curve or a Pricing Node in the PJM system.

PJM Answer

The term "at the associated pricing point" was intended to refer to real-time LMP ("RT LMP") at the pricing node ("PNODE") that is associated with the registration's PRD Curve in the PJM Real-time Energy Market. An evaluation of performance takes place if the PRD Curve indicates that there are expected demand reductions at price points on the PRD Curve that are at or below the RT LMP. If there was no expected demand reduction at the price point on the PRD Curve that corresponds to the RT LMP, then compliance would not be measured and a shortfall would not be calculated.

The proposed inclusion of the "at the associated pricing point" language in the RAA may be unclear as it could be interpreted to mean that a performance evaluation does not take place if there is any price point on the PRD Curve that is above the RT LMP at the PNODE. This was not the intent of the inclusion of this language. To provide clarity and maintain consistency between the language in the RAA and the Tariff, PJM agrees to remove the term "at the associated pricing point" from the proposed RAA, Schedule 6.1.N in a subsequent compliance filing if directed by the Commission.

b. Please explain the meaning of "the highest real-time LMP recorded during the Performance Assessment Interval." Specifically, why is there more than one recorded LMP during a particular interval for a given PRD

[27] PJM Transmittal at 8-9.

registration? Does a PRD registration span multiple Pricing Nodes? Or does this language refer to the highest LMP observed at a given Pricing Node over the duration of a performance assessment event? Or does this language refer to the highest LMP observed across the PJM system—including outside the area of the PRD registration?

PJM Answer

The term "highest" is no longer necessary in this context after real-time settlements were revised from hours to intervals. A Performance Assessment Interval refers to each Real-time Settlement Interval for which an Emergency Action has been declared by PJM. When the Real-time Settlement Interval was an hour (prior to 5-minute settlement implementation), it was appropriate to state as the highest (5 minute) RT LMP recorded during the Performance Assessment Interval. With the implementation of 5-minute settlements, however, it is no longer necessary to state as the highest RT LMP during the Performance Assessment Interval since there is only one RT LMP at a PNODE for a Performance Assessment Interval. As a result, PJM agrees to remove the term "highest" from the proposed RAA, Schedule 6.1.N and Tariff, Attachment DD, section 10A(d) in a subsequent compliance filing if deemed appropriate by the Commission.

A PRD registration does not span multiple PNODE and is required to specify a single PNODE. The language is intended to refer to the 5-minute RT LMP for the Performance Assessment Interval at the PNODE that is specified in the PRD registration.

c. Would a PRD registration be exempt from Non-Performance Charges for the Performance Assessment Interval when any price point in its PRD Curve (even the highest price point) exceeds the highest real-time LMP recorded during the Performance Assessment Interval?

PJM Answer

Under the proposed rule change, PRD is exempt from Non-Performance Charges during a Performance Assessment Interval if no demand reduction is expected at the PNODE that is

associated with the relevant PRD Curve. Since a PRD Curve can consist of many price points with varying demand levels, no demand reduction is expected when the highest RT LMP is below the price point and specified load on the associated PRD Curve during the Performance Assessment Interval. In other words, PRD is exempt from Non-Performance Charges for the portion of the PRD Curve where the pricing points exceed RT LMP.

d. Would a PRD registration be required to verify its performance for the Performance Assessment Interval when any price point in its PRD Curve (even the lowest price point) is less than or equal to the highest real-time LMP recorded during the Performance Assessment Interval? At what level would it be required to perform to avoid Non-Performance Charges?

PJM Answer

The PRD resource is required to perform, and would be required to verify its performance, when there is an expected demand reduction at the price point on the registration's PRD Curve that corresponds to the RT LMP for the Performance Assessment Interval at the PNODE that is specified in the Registration. The PRD is expected to be at or below the specified demand level on the PRD Curve that corresponds to the RT LMP to avoid Non-Performance Charges. Such demand level on the PRD Curve may be higher than the Firm Service Level specified in the registration.

e. Consider a hypothetical PRD Provider with a peak load (absent PRD) of 800 MW, a Nominal PRD Value of 200 MW, a Firm Service Level of 600 MW, and a PRD Curve with three price/quantity pairs as follows:

Real-Time LMP ($/MWh)	***Maximum Demand (MW)***
Less than 1000	*800*
1000-1500	*700*
Greater than 1500	*600*

What maximum demand in MW would be required for this PRD Provider to avoid Non-Performance Charges when the highest real-time LMP recorded during a Performance Assessment Interval is less than $1000/MWh, between $1000/MWh and $1500/MWh, and greater than $1500/MWh? In other words, is the PRD Provider expected to reduce its maximum demand to its Firm Service Level or to the quantity of MW specified in its PRD Curve corresponding to the prevailing LMP? Because PJM's proposed RAA revision states "compliance is measured for a PRD registration," please explain how PJM would measure compliance at individual registrations associated with the hypothetical PRD Provider specified above.

PJM Answer

To answer this question, an additional assumption for the relevant loss factor is needed. Assume this example is for a Performance Assessment Interval in the summer period and the PLC for registration = 800 MW and EDC loss factor = 1.0. The PRD Provider would avoid a Non-Performance Charge when the RT LMP is less or equal to $1000/MWh and metered load is less than or equal to 800 MW. The Provider would avoid a Non-Performance Charge when the RT LMP is between $1,000/MWh and $1,500 MW and the metered load is less than or equal to 700 MW. The PRD Provider would avoid a Non-Performance Charge when the RT LMP is greater than or equal to $1,500 MW and the metered load is less than or equal to 600 MW. The PRD Provider is expected to reduce its metered demand to the quantity of demand MW specified at the price point equal to the RT LMP on the PRD Curve.

f. PJM proposes to define Actual Performance for a PRD Provider as "the actual load reduction provided by the PRD Provider during a Performance Assessment Interval, determined in accordance with the PJM Manuals."[28] *Please explain how PJM proposes to calculate a PRD Provider's Actual Performance during a Performance Assessment Interval, including how PJM will measure performance for a PRD Provider with multiple PRD registrations.*

[28] PJM Transmittal, Attachment A at 45.

PJM Answer

For each registration in an Emergency Action Area, the Actual Performance is equal to the actual load reduction for such registration during the Performance Assessment Interval. To calculate how Actual Performance is measured for a PRD Provider with multiple registrations, the Actual Performance for a PRD Provider in the Emergency Action Area for the Performance Assessment Interval is equal to the sum of the Actual Performance of the PRD registrations that were measured for compliance for such Emergency Action Area and Performance Assessment Interval.

As explained in PJM's March 20, 2019 Answer, PJM provided a detailed description of how a PRD Provider's Actual Performance during a Performance Assessment Interval will be calculated in RAA, Schedule 6.1.N, which states:

> The actual load reduction provided by the registration for the Performance Assessment Interval in the summer period (June through October and the following May of the Delivery Year) is calculated as the registration's peak load contribution minus (the metered load multiplied by the loss factor). A load reduction will only be recognized if metered load multiplied by the loss factor is less than the peak load contribution. For the non-summer period (November through April of the Delivery Year), actual load reduction for a Performance Assessment Interval is calculated as (registration's Winter Peak Load multiplied by Zonal Winter Weather Adjustment Factor multiplied by loss factor) minus (the metered load multiplied by the loss factor). When five minute revenue meter data is not available to determine compliance of a PRD registration for a Performance Assessment Interval, the actual load reduction for a Performance Assessment Interval is calculated as the actual hourly load reduction for the hour ending that includes the Performance Assessment Interval(s) multiplied by (twelve divided by the number of five minute intervals the PRD registration was to be measured for compliance). The actual load reduction for a registration for a Performance Assessment Interval is capped at the peak load contribution of the registration in the summer period and at the Winter Peak Load of the registration times Zonal Winter Weather Adjustment Factor times loss factor in the winter period. If the PRD Provider fails to submit actual metered data for the registration for all hours

during the day of a Performance Assessment Interval, the actual load reduction for such registration will be equal to zero MWs.[29]

This is consistent with how a load reduction is calculated for a Demand Resource registration. For clarity, should the Commission deem appropriate in a subsequent compliance filing, PJM agrees to include a reference to RAA, Schedule 6.1.N in the determination of Actual Performance in Tariff, Attachment DD, section 10A(g).

g. Has PJM analyzed the potential effect upon customer responsiveness to retail rates, and any potential effect upon real time energy markets or operations, of the modifications it proposes in the filing?

PJM Answer

As noted in response to question 1(a), PJM did not see any PRD participation until the 2017 BRA for the 2020/2021 Delivery Year, after the inception of Capacity Performance. At that point, certain resources that had previously participated as Demand Response converted to PRD seemingly to avoid the Demand Resource annual load reduction requirement. The first Delivery Year in which PRD is expected to perform – the 2020/2021 Delivery Year - has not yet occurred. Given that, PJM does not have a baseline of performance against which it could measure the impact. Further, given the relatively small level of participation, PJM has not analyzed the potential effects on real time energy markets or operations of the cleared PRD. PJM has also not analyzed the potential effect upon customer responsiveness to retail rates. In general, PJM believes that PRD remains an important enhancement to the efficient operation of the market by providing needed demand elasticity on the requirements of load serving entities, so long as its performance measurement is comparable to that of other Capacity Performance Resources.

[29] See proposed RAA, Schedule 6.1.N

5. *PJM proposes to revise the existing compliance charge rate[30] for PRD to match the Non-Performance Charge Rate[31] for Capacity Performance Resources.[32]*

   a. *Please provide the dollar value of the Non-Performance Charge Rate for Capacity Performance Resources and the existing compliance charge rate for PRD for one or more prior Delivery Years and one or more Locational Deliverability Areas (LDAs).*

PJM Answer

A side-by-side comparison between the existing non-compliance charge and proposed Non-Performance Charge Rate for PRD is difficult to portray given that the existing rate is one rate for the entire duration of the Maximum Emergency while the proposed rate is based on a rate for each Performance Assessment Interval. Notwithstanding, PJM is providing a table below that attempts to compare the dollar values of the proposed Non-Performance Charge Rate and the existing compliance charge rate for PRD for the RTO and DPL Zone.

Existing compliance charge rate:

The PRD Event Compliance Penalty Rate for PRD committed to RPM is equal to the PRD Provider's Weighted Final Zonal Capacity Price in such Zone plus the greater of (0.20 times the PRD Provider's Weighted Final Zonal Capacity Price in such Zone or $20/MW-day) times the number of days in the Delivery Year. A PRD Provider's Weighted Final Zonal Capacity Price is the average of the Final Zonal Capacity Price and the price component of the Final Zonal Capacity Price due to the Third Incremental Auction ("IA"), weighted by the Nominal PRD Values committed by such PRD Provider in BRA and Third IA.

[30] *See* PJM, Intra-PJM Tariffs, RAA, Schedule 6.1 § K (2.0.0).

[31] *See* PJM, Intra-PJM Tariffs, OATT, Attachment DD § 10A(e) (5.0.0).

[32] PJM Transmittal at 9-10.

The PRD Maximum Generation Emergency Compliance Penalty for the first Maximum Generation Emergency is the net event compliance shortfall in zone times * Delivery Year Forecast Pool Requirement * PRD Event Compliance Penalty Rate. The penalty charge for a subsequent Maximum Generation Emergency in the sub-zone/zone shall be assessed only on the portion of the net event compliance shortfall in the sub-zone/zone that exceeds the maximum net event compliance shortfall in any prior Maximum Generation Emergency. This results in an implied maximum amount of compliance penalties that will be assessed for the delivery year (i.e. an implied stop-loss).

Proposed Non-Performance Charge rate:

The Non-Performance Charge Rate to be applied to shortfalls associated with Capacity Performance or PRD commitments for a Performance Assessment Interval is equal to [the modeled LDA Net CONE for which the resource resides ($/MW-day in installed capacity terms) times number of days in Delivery Year divided by 30] divided by the number of Real-Time Settlement Intervals in an hour.

For Capacity Performance Resources or PRD Providers, the maximum yearly Non-Performance Charge (i.e., stop loss) is 1.5 times the modeled LDA Net CONE ($/MW-day in installed capacity terms) times number of days in Delivery Year times the maximum daily unforced capacity committed by the resource or PRD Provider during June 1 of the Delivery Year through the end of the month for which the Non-Performance Charge was assessed.

Comparison of Current and Proposed Non-Performance Charge Rates.

Delivery Year	LDA	FZCP	NCONE	# of Days in DY	Current Rate ($/ICAP MW-Max Emergency Event)	Current Implied Stop Loss ($/ICAP MW Commited-Year)	Proposed Rate ($/ICAP MW-PAI)	Proposed Stop Loss ($/UCAP MW Committed-Year)
2019/2020	RTO	$98	$280	366	$43,214	$43,214	$284	$153,473
2019/2020	DPL	$118	$245	366	$51,790	$51,790	$249	$134,483
2018/2019	RTO	$165	$281	365	$72,139	$72,139	$285	$154,116
2018/2019	DPL	$226	$242	365	$99,084	$99,084	$245	$132,451

In the chart above: FZCP = Final Zonal Capacity Price; NCONE = Net Cost of New Entry

b. Please provide one or more examples to demonstrate the total amount in dollars that a PRD Provider would be charged for non-performance under both the existing PRD rules and the proposed PRD rules. Would PRD Providers always be charged more under the proposed rules, always be charged less under the proposed rules, or does it depend on the duration of Performance Assessment Interval(s)/maximum emergency event(s)?

PJM Answer

It is difficult to judge whether or not the PRD Provider will always be charged more or less under the proposed rules due to the difference between Final Zonal Capacity Price (basis for the current charge rate) and Net CONE (basis for the proposed charge rate) for the Delivery Year, the duration of Maximum Generation Emergency event(s) in a Delivery Year, and the number of Performance Assessment Intervals in a Delivery Year that are triggered by other emergency procedures other than a Maximum Generation Emergency Action. In addition, under the proposed revisions, a PRD Provider has an opportunity to receive bonus performance payments if PRD Provider's Actual Performance exceeds their Expected Performance during a Performance Assessment Interval.

Notwithstanding, two examples are provided below to demonstrate the total amount in dollars that a PRD Provider would be charged for non-performance under both the existing and proposed PRD rules. In Example 1 with 24 Performance Assessment Intervals (2 hours), the

proposed charges for RTO for 2019/2020 Delivery Year are $6,821, only 14% of the current charges of $47,081. In Example 2 with 168 Performance Assessment Intervals (14 hours), the proposed charges for RTO for 2019/2020 Delivery Year are $47,747, close to the current charges of $47,081. In other words, if the PRD Provider fails to perform to its applicable commitment levels, the current charge rate results in reaching the current implied stop loss after one Maximum Generation Emergency event, whereas the proposed Non-Performance Charge will not result in the reaching the proposed stop loss unless there is a significantly large number of Performance Assessment Intervals, as illustrated in the examples below:

Example 1: Assumes PRD Provider failed to respond to 1 Maximum Generation Emergency Action that lasted 2 hours. Equates to 24 five-minute Performance Assessment Intervals.

Delivery Year	LDA	FZCP	NCONE	# of Days in DY	Current Rate ($/ICAP MW-Max Gen Emergency Event)	Proposed Rate ($/MW-PAI)	# of PAIs (2 Hours)	Nominal PRD Value Committed (ICAP MW)	Shortfall MW (ICAP MW)	Forecast Pool Requirement	Current Charges	Current Implied Stop Loss	Proposed Charges	Proposed Stop Loss
2019/2020	RTO	$98	$280	366	$43,214	$284	24	1	1	1.0895	$47,081	$47,081	$6,821	$167,209
2019/2020	DPL	$118	$245	366	$51,790	$249	24	1	1	1.0895	$56,426	$56,426	$5,977	$146,519
2018/2019	RTO	$165	$281	365	$72,139	$285	24	1	1	1.0905	$78,667	$78,667	$6,850	$168,063
2018/2019	DPL	$226	$242	365	$99,084	$245	24	1	1	1.0905	$108,051	$108,051	$5,887	$144,438

Example 2: Assumes PRD Provider failed to respond to 1 Maximum Generation Emergency Action that lasted 14 hours. Equates to 168 five-minute Performance Assessment Intervals.

Delivery Year	LDA	FZCP	NCONE	# of Days in DY	Current Rate ($/ICAP MW-Max Gen Emergency Event)	Proposed Rate ($/MW-PAI)	# of PAIs (14 Hours)	Nominal PRD Value Committed (ICAP MW)	Shortfall MW (ICAP MW	Forecast Pool Requirement	Current Charges	Current Implied Stop Loss	Proposed Charges	Proposed Stop Loss
2019/2020	RTO	$98	$280	366	$43,214	$284	168	1	1	1.0895	$47,081	$47,081	$47,747	$167,209
2019/2020	DPL	$118	$245	366	$51,790	$249	168	1	1	1.0895	$56,426	$56,426	$41,839	$146,519
2018/2019	RTO	$165	$281	365	$72,139	$285	168	1	1	1.0905	$78,667	$78,667	$47,947	$168,063
2018/2019	DPL	$226	$242	365	$99,084	$245	168	1	1	1.0905	$108,051	$108,051	$41,207	$144,438

6. PJM proposes to revise the credit requirement for PRD to align the credit rate with all Capacity Performance Resources.[33]

a. The PJM OATT discusses how the RPM Auction Credit requirement is reduced as a Capacity Performance Resource attains certain milestones.[34] *For PRD, the Tariff states that the credit requirement "shall be reduced as and to the extent the PRD Provider registers PRD-eligible load at a PRD Substation level to satisfy its Nominal PRD Value commitment, in accordance with Reliability Assurance Agreement, Schedule 6.1."*[35]

[33] PJM Transmittal at 12-14.

[34] *See, e.g.*, PJM, Intra-PJM Tariffs, OATT, Attachment Q, § IV.B.3(c) (35.0.0).

[35] PJM, Intra-PJM Tariffs, OATT, Attachment Q, § IV.B.3 (35.0.0).

Please explain why there is a different process to reduce the credit requirement for PRD and Capacity Performance Resources. Please also provide examples detailing how the credit requirements are reduced for a PRD Provider as it achieves milestones in the run up to the Delivery Year.

PJM Answer

The different process for reductions to the credit requirement between PRD and Generation Capacity Performance Resources is merited given the inherent differences between generation resources and load curtailment resources. As PRD Registrations are approved, the number of current end-use customers registered by a Curtailment Service Provider rises and the MW quantity deemed to be at risk of non-performance is reduced. Therefore, it is appropriate to reduce the credit requirement as the number of registered end-use customers increase. This RPM Auction Credit requirement is consistent with how the credit requirement is reduced for Demand Resources, as provided in Tariff, Attachment Q, section IV.B.3(a):

> For Planned Demand Resources and Energy Efficiency Resources, the RPM Auction Credit requirement will be reduced in direct proportion to the megawatts of such Demand Resource that the Resource Provider qualifies as a Capacity Resource, in accordance with the procedures established under the Reliability Assurance Agreement.

PJM is not recommending changes to the reduction in credit requirement, but rather how the credit rate is determined to conform with other Capacity Performance requirements, such as Demand Resource. This is appropriate because a reduction on the demand side effectively reduces a Capacity Performance commitment on the supply side.

Thus, a reduction in the credit requirement for PRD can be achieved as PRD Providers register load end-use customers in the designated PJM system. As an example, if a PRD commits 100 MW PRD (UCAP) in the BRA with a credit rate of $50,000, then the credit requirement would equal $5,000,000. As the Delivery Year approaches and the PRD Provider registers 60

MW (UCAP) of load, then the MW requiring credit would reduce from 100 MW to 40 MW and causes the credit requirement to be reduced to $2,000,000.

III. CORRESPONDENCE AND COMMUNICATIONS

Correspondence and communications regarding this filing should be sent to the following individuals:

Craig Glazer
Vice President–Federal Gov't Policy
PJM Interconnection, L.L.C.
1200 G Street, N.W.
Suite 600
Washington, D.C. 20005
(202) 423-4743
craig.glazer@pjm.com

Chenchao Lu
Counsel
PJM Interconnection, L.L.C.
2750 Monroe Boulevard
Audubon, PA 19403
(610) 666-2255
chenchao.lu@pjm.com

IV. SERVICE

PJM has served a copy of this filing on all PJM members and on all state utility regulatory commissions in the PJM Region by posting this filing electronically. In accordance with the Commission's regulations,[36] PJM will post a copy of this filing to the FERC filings section of its internet site, located at the following link: http://www.pjm.com/documents/ferc-manuals/ferc-filings.aspx with a specific link to the newly-filed document, and will send an e-mail on the same date as this filing to all PJM members and all state utility regulatory commissions in the PJM Region[37] alerting them that this filing has been made by PJM and is available by following such link. PJM also serves the parties listed on the Commission's official service list for this docket. 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

[36] *See* 18 C.F.R. §§ 35.2(e) and 385.2010(f)(3).

[37] PJM already maintains, updates, and regularly uses e-mail lists for all PJM members and affected state commissions.

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 on each person designated on the official service list maintained by the Commission for this proceeding.

V. CONCLUSION

Wherefore, PJM requests that the Commission accept this response to the Commission's deficiency letter.

Respectfully submitted,

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

Chenchao Lu
Counsel
PJM Interconnection, L.L.C.
2750 Monroe Boulevard
Audubon, PA 19403
(610) 666-2255
Chenchao.Lu@pjm.com

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

CERTIFICATE OF SERVICE

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

Dated at Audubon, PA this 29th day of April 2019.

/s/ *Chen Lu*
Chenchao Lu
Counsel
PJM Interconnection, L.L.C.
2750 Monroe Boulevard
Audubon, PA 19403
(610) 666-2255
chenchao.lu@pjm.com