

FEDERAL ENERGY REGULATORY COMMISSION  
WASHINGTON, DC 20426

OFFICE OF ENERGY MARKET REGULATION

In Reply Refer To  
PJM Interconnection, L.L.C.  
Docket No. ER21-278-000

Issued: December 22, 2020

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

Attention: Thomas DeVita  
Senior Counsel

Reference: Effective Load Carrying Capability Construct

Dear Mr. DeVita:

On October 30, 2020, in Docket No. ER21-278-000, PJM Interconnection, L.L.C. (PJM) filed, pursuant to section 205 of the Federal Power Act (FPA), proposed revisions to its Open Access Transmission Tariff (OATT) and Reliability Assurance Agreement (RAA) to implement an Effective Load Carrying Capability (ELCC)<sup>1</sup> construct for determining the relative amount of capacity that variable, limited duration, and combination resources may offer in PJM's capacity market or provide in a Fixed Resource Requirement (FRR) capacity plan.<sup>2</sup> PJM states that the ELCC methodology is a technology-neutral approach that is based on loss-of-load probability and is designed to determine a resource's effective contribution to resource adequacy.<sup>3</sup> PJM explains that the ELCC analysis distinguishes among generators with differing levels of reliability, size, and hourly output profiles to determine an ELCC rating for a given resource or a

---

<sup>1</sup> Capitalized terms not defined herein are used as they are defined in the current and proposed OATT and RAA.

<sup>2</sup> Transmittal at 1.

<sup>3</sup> Transmittal at 3.

class of resources (an ELCC Class Rating).<sup>4</sup>

Please be advised that your submittal is deficient and that additional information is required in order to process the filing. Please provide the information requested below. To the extent that some of the required information may contain confidential material, please submit a non-public version in addition to the public version for Commission review.

1. In your filing, you state that PJM will utilize an ELCC analysis to allocate the ELCC Portfolio Unforced Capacity (UCAP) amongst ELCC Classes, “such that the aggregate of all ELCC Class UCAP values is equal to the ELCC Portfolio UCAP.”<sup>5</sup> Affiant Dr. Rocha Garrido further explains that, while the ELCC Portfolio UCAP is an unambiguous value, the allocation of this value amongst ELCC Classes is a heuristic that requires multiple additional ELCC runs and generally includes: (1) determination of ELCC for each ELCC Class in the absence of all other ELCC Classes (ELCC “First-In” runs); (2) determination of ELCC for each ELCC Class in the presence of all other ELCC Classes (ELCC “Last-In” runs); and (3) use of the First-In and Last-In runs to allocate the ELCC Portfolio UCAP value and establish the ELCC Class UCAP values.<sup>6</sup> The corresponding proposed RAA language states that “[t]he ELCC Portfolio UCAP shall be allocated to each ELCC Class UCAP, in accordance with the applicable [ELCC] analysis methodology specified in the PJM Manuals. . . .”<sup>7</sup>
  - a. Please describe the methodology PJM will use to allocate the ELCC Portfolio UCAP amongst ELCC Classes to establish the ELCC Class UCAP values and ELCC Class Ratings, including how the results of the First-In and Last-In runs for each ELCC Class will be used. Please include a detailed explanation of any relevant formulas or procedures.
  - b. We also note that your filing references a stakeholder presentation

---

<sup>4</sup> Transmittal at 9.

<sup>5</sup> Transmittal at 32 (quoting Proposed RAA, Schedule 9.1, § C).

<sup>6</sup> Attachment C, Affidavit of Dr. Patricio Rocha Garrido (Garrido Affidavit) at P 25.

<sup>7</sup> Proposed RAA, Schedule 9.1, § C.

by Energy+Environmental Economics (E3).<sup>8</sup> Is the method discussed in this presentation the same as the method referenced in Question 1(a)? Please confirm if PJM will employ this method as part of the procedures it implements under its proposal?<sup>9</sup>

- c. If PJM were to revise the method described in response to (a) and (b) at some point in the future, please explain how this would affect any ELCC Class Rating floors previously calculated for annual cohorts of resources.
2. In your filing, you state that, with the exception of an express stipulation in the proposed RAA that ELCC Classes be defined for Limited Duration Resources with 4-hour, 6-hour, 8-hour, and 10-hour durations (with matching durations for Combination Resources that are composed in part of one or more such ELCC Classes), PJM proposes to define the specific ELCC Classes in its Manuals. You state that this is, in part, an acknowledgement that innovation and technological change may considerably alter the kind of resources participating in PJM's ELCC construct in the coming years, thereby making recitation of all possible ELCC Class permutations in the RAA impracticable.<sup>10</sup>
    - a. In your filing, you note that both tracking and fixed-tilt solar resources might share an ELCC Class.<sup>11</sup> If PJM were to initially include these resources in the same ELCC Class, and then treat them as belonging to two different classes at some point in the future, please explain how this would affect the calculation of ELCC Class UCAP, ELCC Class Rating, and ELCC Class Rating floor values. How would the transition mechanism apply to resources that may be moved into a different ELCC Class than the one that was used to establish the ELCC Class Rating floors for their annual cohort?
  3. In your filing, you state that, for any given Delivery Year, ELCC Resources will be assigned an Accredited UCAP based on the higher of the ELCC

---

<sup>8</sup> Transmittal at 14 n.34.

<sup>9</sup> Proposed RAA, Schedule 9.1, § C (“The ELCC Portfolio UCAP shall be allocated to each ELCC Class UCAP, in accordance with the applicable effective load carrying capability analysis methodology specified in the PJM Manuals . . .”).

<sup>10</sup> Transmittal at 17.

<sup>11</sup> Transmittal at 32.

Class Rating floor value or the ELCC Class Rating calculated under the standard ELCC methodology. You also state that, if the ELCC Class Rating floor “binds” for any ELCC Resources, PJM must reduce the ELCC Class Rating of certain other ELCC Resources to preserve the ELCC Portfolio UCAP and ELCC Class UCAP values. You state that, to broaden the base for spreading these offsetting adjustments, PJM will work with stakeholders to group classes that have similar relevant physical characteristics (e.g. 4-hour and 6-hour storage) to produce groups that are broad enough to include a significant fraction of the ELCC Portfolio UCAP. Furthermore, you state that, as a fallback, PJM will offset ELCC Class Ratings on a total ELCC portfolio basis if there are not sufficient offsets available from resources within a group (i.e., without pushing those resources below the floor).<sup>12</sup>

- a. Please explain in detail how PJM will allocate ELCC Class Rating reductions across ELCC Class groups if the ELCC Class Rating floor binds for one or more ELCC Classes within the group.
- b. Please provide examples of classes of resources that PJM considers as having similar relevant physical characteristics, in addition to the example of 4-hour and 6-hour storage resources provided in your filing. Specifically, please explain how PJM and stakeholders will identify the characteristics used to establish similar classes for wind resources, solar resources, various classes of Combination Resources, and other common ELCC Resources.<sup>13</sup>
- c. Recognizing that resources will have their Accredited UCAP reduced if PJM determines that they have similar relevant physical characteristics to an ELCC Class for which the floor bound, please explain how PJM will resolve any disputes regarding which ELCC Classes share relevant physical characteristics for the purposes of offsetting adjustments to ELCC Class Rating.
- d. Is it possible for ELCC Class Rating floors to bind to such an extent that PJM would be unable to identify sufficient offsetting reductions in ELCC Class Ratings across the ELCC portfolio to preserve the ELCC Portfolio UCAP? If so, how would PJM ensure that ELCC Resources are not assigned an aggregate UCAP greater than the

---

<sup>12</sup> Transmittal at 54-56.

<sup>13</sup> As noted in question 2, we recognize that PJM does not propose to define explicit classes for wind and solar resources in its OATT or RAA.

## ELCC Portfolio UCAP?

4. In your filing, you state that the Accredited UCAP sets a maximum amount of capacity an ELCC Resource may offer or provide in a given Delivery Year, subject to the amount of Capacity Interconnection Rights (CIRs) secured for the resource. Specifically, you state that the amount of capacity an ELCC Resource can provide is the lesser of its Accredited UCAP and its CIRs.<sup>14</sup>
  - a. Please explain the process used to determine the quantity of CIRs a Variable Resource, Limited Duration Resource, or Combination Resource secures upon interconnection, including any relevant tariff or Manual citations. How does the quantity of CIRs these resources secure compare to their nameplate capacity, existing UCAP valuation, and Accredited UCAP under the instant proposal? Please provide one or two illustrative examples.
  - b. Please explain whether the instant filing will affect the quantity of CIRs that ELCC Resources secure upon interconnection.
  - c. If the application of the ELCC analysis proposed in the instant filing results in an Accredited UCAP greater than a resource's existing CIRs, please explain whether the resource will be able to secure additional CIRs sufficiently in advance to offer its full Accredited UCAP into the capacity market.
  - d. If a resource's Accredited UCAP is less than its existing CIRs, what will happen to the resource's unused CIRs in excess of its Accredited UCAP? Will the resource have any opportunity to shed or transfer unused CIRs?
  - e. If a Variable Resource or Combination Resource has CIRs equal to its Accredited UCAP, would this level of CIRs demonstrate sufficient deliverability to meet the Loss of Load Expectation standard on which the ELCC analysis and the resource's Accredited UCAP are calibrated?
5. In support of your proposal to implement the ELCC construct with the 2023/2024 Delivery Year, you state that it would produce undesirable effects to run a Base Residual Auction for a given Delivery Year under the status quo capacity capability determination rules, and then switch to the

---

<sup>14</sup> Transmittal at 39-40.

ELCC construct for subsequent Incremental Auctions.<sup>15</sup>

- a. Please explain in more detail the undesirable effects to which PJM refers in the statement above.
  - b. How do these effects compare to adjustments in ELCC Resources' Accredited UCAP and/or Unlimited Resources' Equivalent Demand Forced Outage Rate (EFORd) between the Base Residual Auction and Third Incremental Auction to which you refer in your filing?<sup>16</sup>
6. In the instant filing, you state that the ELCC Class Rating is analogous to the "capacity factor" for wind and solar resources that is referred to in PJM Manual 21, reflecting the performance characteristics or history of the resource type that PJM has used to de-rate wind and solar resources and determine the maximum Unforced Capacity such resources may provide in a given Delivery Year.<sup>17</sup>
- a. Please provide any preliminary estimates of the ELCC Class Ratings for various classes of resources and the resource mixes PJM considered in developing those estimates.
  - b. How do the preliminary ELCC Class Rating values for various classes of resources compare to the current deration factors PJM applies to those resources under its current rules, including the

---

<sup>15</sup> Transmittal at 62 n.141.

<sup>16</sup> Transmittal at 47 ("Under PJM's proposal, if final ELCC Class Ratings exceed preliminary ratings for the same Delivery Year, Capacity Market Sellers may have an opportunity to sell additional UCAP in the third Incremental Auction for such Delivery Year. By contrast, if final ELCC Class Ratings are less than preliminary ones, then Capacity Market Sellers might need to buy back any shortfalls in order to avoid applicable Deficiency Charges. This is identical to the process in place today, where an Unlimited Resource's final EFORd is not known until the December before the Delivery Year, and if the EFORd is higher than was what assumed at the time of the Base Residual Auction for the Delivery Year, the seller must make up the shortfall or face Deficiency Charges." (citing OATT, Attachment DD, § 8)).

<sup>17</sup> Transmittal at 33 (citing PJM, *Manual 21: Rules and Procedures for Determination of Generating Capability*, at Appendix B (2019), <https://www.pjm.com/-/media/documents/manuals/m21.ashx>).

“capacity factors” used for wind and solar resources, the 10-hour rule used for Capacity Storage Resources, and any other relevant existing rules?

7. In the instant filing, you propose to determine the Accredited UCAP for a Combination Resource with a Variable Resource component based on the sum of the Accredited UCAP for its Variable Resource component and the Accredited UCAP for its Limited Duration Resource component. You state that the latter value is based on the actual reliability value of the fully-fledged Combination Resource class, rather than inappropriately applying the separately derived reliability value for a standalone Limited Duration Resource.<sup>18</sup>
  - a. Under PJM’s proposal, would a Combination Resource offer into the capacity market as a single resource or two separate resources? Please provide any relevant tariff or manual citations.
  - b. If a Combination Resource would be eligible to offer into the capacity market as two separate resources, could it offer just one of its component resources into the PJM capacity market, even though its Accredited UCAP would be based on both of its component resources? Please provide any relevant tariff or manual citations.
  - c. How would a Combination Resource participate in the PJM energy and ancillary services markets under PJM’s current market rules? Would it participate as a single resource or as multiple resources? Please provide any relevant tariff or manual citations.

This letter is issued pursuant to 18 C.F.R. § 375.307 and is interlocutory. This letter is not subject to rehearing under 18 C.F.R. § 385.713. A response to this letter must be filed with the Secretary of the Commission within 30 days of the date of this letter by making a deficiency filing in accordance with the Commission’s electronic tariff requirements. For your response, use Type of Filing Code 170 if your company is registered under program code “M” (Electric Market Based Rate Public Utilities) or Type of Filing Code 180 if your company is registered under program code “E” (Electric Traditional Cost of Service and Market Based Rates Public Utilities).<sup>19</sup> In addition,

---

<sup>18</sup> PJM Transmittal at 40-41; Proposed RAA Schedule 9.1, §§ D, E.

<sup>19</sup> The filing must include at least one tariff record to restart the statutory timeframe for Commission action even though a tariff revision might not otherwise be needed. *See generally Electronic Tariff Filings*, 130 FERC ¶ 61,047, at PP 3-8 (2010) (explaining that the Commission uses the data elements resulting from the tariff filing

Docket No. ER21-278-000

- 8 -

submit an electronic version of your response to Robert Fares at robert.fares@ferc.gov. The information requested in this letter order will constitute an amendment to your filing and a new filing date will be established.<sup>20</sup> A notice will be issued upon receipt of your filing.

Pending receipt of the above information, a filing date will not be assigned to your filing. Failure to respond to this letter order within the time period specified may result in a further order rejecting your filing.

Issued by: Kurt M. Longo, Director, Division of Electric Power Regulation – East

---

process to establish statutory filing and other procedural dates).

<sup>20</sup> See *Duke Power Co.*, 57 FERC ¶ 61,215, at 61,713 (1991) (“the Commission will consider any amendment or supplemental filing filed after a utility’s initial filing . . . to establish a new filing date for the filing in question”).



Document Content(s)

ER21-278-000 - Deficiency Letter.DOCX.....1