

183 FERC ¶ 61,117  
UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Willie L. Phillips, Acting Chairman;  
James P. Danly, Allison Clements,  
and Mark C. Christie.

PJM Interconnection, L.L.C.

Docket No. ER22-2359-000

ORDER ON COMPLIANCE FILING

(Issued May 18, 2023)

1. On July 12, 2022, PJM Interconnection, L.L.C. (PJM) submitted proposed revisions to its Open Access Transmission Tariff (Tariff) in compliance with the requirements of Order No. 881,<sup>1</sup> a final rule that revised both the *pro forma* Open Access Transmission Tariff (OATT) and the Commission's regulations under section 206 of the Federal Power Act (FPA)<sup>2</sup> to improve the accuracy and transparency of electric transmission line ratings.<sup>3</sup> In this order, we accept in part PJM's compliance filing, to become effective no later than July 12, 2025, as requested, subject to further compliance.

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<sup>1</sup> *Managing Transmission Line Ratings*, Order No. 881, 177 FERC ¶ 61,179 (2021), *order addressing arguments raised on reh'g*, Order No. 881-A, 179 FERC ¶ 61,125 (2022).

<sup>2</sup> 16 U.S.C. § 824e.

<sup>3</sup> A transmission line rating is the:

[m]aximum transfer capability of a transmission line, computed in accordance with a written Transmission Line Rating methodology and consistent with Good Utility Practice, considering the technical limitations on conductors and relevant transmission equipment (such as thermal flow limits), as well as technical limitations of the Transmission System (such as system voltage and stability limits). Relevant transmission equipment may include, but is not limited to, circuit breakers, line traps, and transformers.

*Pro forma* OATT, attach. M, Definitions; *see also* Order No. 881, 177 FERC ¶ 61,179 at PP 1, 44.

## I. Background

2. In Order No. 881, the Commission found that, because of the relationship between transmission line ratings and wholesale rates, inaccurate transmission line ratings cause the rates for the transmission of electric energy in interstate commerce and the sale of electric energy at wholesale in interstate commerce to be unjust and unreasonable.<sup>4</sup> To ensure just and reasonable wholesale rates that more accurately reflect the cost of the wholesale service being provided (i.e., energy, capacity, ancillary services, or transmission service), the Commission adopted reforms that impose certain obligations on transmission providers<sup>5</sup> and public utility transmission owners with respect to transmission line ratings.<sup>6</sup>

3. In Order No. 881, the Commission required: (1) transmission providers to implement ambient-adjusted ratings (AAR)<sup>7</sup> for near-term transmission service requests on the transmission lines over which they provide transmission service; (2) transmission

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<sup>4</sup> Order No. 881, 177 FERC ¶ 61,179 at PP 3, 29-30.

<sup>5</sup> In this order, we use transmission provider to mean any public utility that owns, operates, or controls facilities used for the transmission of electric energy in interstate commerce. 18 C.F.R. § 37.3 (2022). Therefore, unless otherwise noted, “transmission provider” refers only to public utility transmission providers. Furthermore, the term “public utility” as found in section 201(e) of the FPA means “any person who owns or operates facilities subject to the jurisdiction of the Commission under this subchapter . . . .” 16 U.S.C. § 824(e).

<sup>6</sup> Order No. 881, 177 FERC ¶ 61,179 at P 29.

<sup>7</sup> An AAR is a:

Transmission Line Rating that: (a) [a]pplies to a time period of not greater than one hour[;] (b) [r]eflects an up-to-date forecast of ambient air temperature across the time period to which the rating applies[;] (c) [r]eflects the absence of solar heating during nighttime periods, where the local sunrise/sunset times used to determine daytime and nighttime periods are updated at least monthly, if not more frequently[; and] (d) [i]s calculated at least each hour, if not more frequently.

*Pro forma* OATT, attach. M, Definitions; *see also* Order No. 881, 177 FERC ¶ 61,179 at P 4.

providers to implement seasonal line ratings<sup>8</sup> for longer-term transmission service requests on the transmission lines over which they provide transmission service; (3) regional transmission organizations and independent system operators (RTO/ISO) to establish and implement the systems and procedures necessary to allow transmission owners to electronically update transmission line ratings at least hourly;<sup>9</sup> (4) transmission providers to use uniquely determined<sup>10</sup> emergency ratings;<sup>11</sup> (5) public utility transmission owners to share their transmission line ratings and transmission line rating methodologies with their respective transmission provider(s) and with market monitors in RTOs/ISOs; (6) transmission providers to share their transmission owners' transmission line ratings and transmission line rating methodologies with any transmission provider(s) upon request; (7) transmission providers to maintain a database of their transmission owners' transmission line ratings and transmission line rating methodologies on the

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<sup>8</sup> A seasonal line rating is a:

Transmission Line Rating that: (a) [a]pplies to a specified season, where seasons are defined by the Transmission Provider to include not fewer than four seasons in each year, and to reasonably reflect portions of the year where expected high temperatures are relatively consistent[;] (b) [r]eflects an up-to-date forecast of ambient air temperature across the relevant season over which the rating applies[; and] (c) [i]s calculated annually, if not more frequently, for each season in the future for which Transmission Service can be requested.

*Pro forma* OATT, attach. M, Definitions; *see also* Order No. 881, 177 FERC ¶ 61,179 at P 204.

<sup>9</sup> Order No. 881, 177 FERC ¶ 61,179 at P 255.

<sup>10</sup> “Uniquely determined” means that the transmission line ratings are determined based on assumptions that reflect the specific, finite duration of emergency ratings, as opposed to using assumptions used to calculate normal ratings. The Commission explained that, by requiring emergency ratings be uniquely determined, they would be based on assumptions that reflect the finite duration of the emergency ratings, as distinct from the assumptions of normal ratings that can be maintained indefinitely. *Id.* PP 294-295.

<sup>11</sup> An emergency rating is “a Transmission Line Rating that reflects operation for a specified, finite period, rather than reflecting continuous operation. An Emergency Rating may assume an acceptable loss of equipment life or other physical or safety limitations for the equipment involved.” *Pro forma* OATT, attach. M, Definitions; *see also* Order No. 881, 177 FERC ¶ 61,179 at P 293.

transmission provider's Open Access Same-Time Information System (OASIS) site or another password-protected website; and (8) transmission providers to post on OASIS or another password-protected website any uses of exceptions or temporary alternate ratings.<sup>12</sup> In addition, the Commission required transmission providers to explain their timelines for calculating or submitting AARs as part of their compliance filings.<sup>13</sup>

## **II. Compliance Filing**

4. PJM proposes to add a new Attachment W to its Tariff.<sup>14</sup> PJM states that the new Attachment W closely mirrors, with minor adjustments, the *pro forma* OATT Attachment M. PJM asserts that its requested adjustments to Order No. 881's *pro forma* OATT Attachment M are consistent with Order No. 881 and allow for consistent use of terminology across PJM's governing documents.

5. PJM states that, consistent with the requirements of Order No. 881, it plans to implement the proposed revisions by July 12, 2025.<sup>15</sup> PJM requests a 12/31/9998 effective date for its compliance filing.

## **III. Notice of Filing and Responsive Pleadings**

6. Notice of PJM's filing was published in the *Federal Register*, 87 Fed. Reg. 42,717 (July 18, 2022), with interventions and protests due on or before August 2, 2022. American Electric Power Service Corporation, Delaware Division of the Public Advocate, Rockland Electric Company, Solar Energy Industries Association, Exelon Corporation, Calpine Corporation, PPL Electric Utilities Corporation, Duquesne Light Company, Old Dominion Electric Cooperative (ODEC), Dominion Energy Services, Inc., North Carolina Electric Membership Corporation, American Municipal Power, Inc., and Monitoring Analytics, LLC, acting in its capacity as the Independent Market Monitor for PJM filed timely motions to intervene. Duke Energy Corporation (Duke Energy) filed an out-of-time motion to intervene on August 11, 2022.

7. ODEC filed comments on August 2, 2022.

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<sup>12</sup> Order No. 881, 177 FERC ¶ 61,179 at PP 4-11.

<sup>13</sup> *Id.* P 143.

<sup>14</sup> Filing, Transmittal Letter at 2.

<sup>15</sup> *Id.* at 8-9.

#### **IV. Discussion**

##### **A. Procedural Matters**

8. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2022), the timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding.

9. Pursuant to Rule 214(d) of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214(d), the Commission will grant Duke Energy's late-filed motion to intervene given its interest in the proceeding, the early stage of the proceeding, and the absence of undue prejudice or delay.

##### **B. Substantive Matters**

10. As discussed below, we find that PJM's proposal partially complies with the requirements of Order No. 881. Accordingly, we accept PJM's filing, subject to further compliance, as discussed below.<sup>16</sup> PJM proposes a 12/31/9998 effective date for its proposed Tariff revisions. However, PJM does not propose a timeline for PJM to provide the Commission with the precise effective date. Accordingly, we direct PJM to file, within 60 days of the date of this order, a further compliance filing that provides an explanation of PJM's timeline for notifying the Commission of the precise effective date of its Tariff revisions.<sup>17</sup>

11. As an initial matter, we find that PJM's proposed tariff language complies with the following requirements of Order No. 881: (1) transmission providers to implement seasonal line ratings for longer-term transmission service requests on the transmission lines over which they provide transmission service; (2) transmission providers to use uniquely determined emergency ratings; (3) public utility transmission owners must share their transmission line ratings and transmission line rating methodologies with their respective transmission provider(s) and with market monitors in RTOs/ISOs; (4) transmission providers to maintain a database of their transmission owners' transmission line ratings and transmission line rating methodologies on the transmission

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<sup>16</sup> PJM should submit its compliance filing in an eTariff submittal using Type of Filing Code 80 – Compliance Filing in the above referenced docket.

<sup>17</sup> When PJM notifies the Commission of the precise effective date of these Tariff records, PJM should submit this filing through eTariff using Type of Filing Code 150 – Report.

provider's OASIS site or another password-protected website.<sup>18</sup> We address each of the remaining issues below.

**1. Transmission Line Rating Definition**

12. In Order No. 881, the Commission adopted in the *pro forma* OATT Attachment M the definition of Transmission Line Rating noted above.<sup>19</sup> The Commission further clarified that the definition of transmission line rating for electric system equipment and the calculation of AARs should not be limited to overhead conductors.<sup>20</sup> Rather, the Commission explained that the definition of transmission line rating reflects the fact that transmission line ratings must incorporate a set of electrical equipment ratings that collectively operate as a single bulk electric system element (e.g., transformers, relay protective devices, terminal equipment, and series and shunt compensation devices) and that the most limiting component from that set determines the transmission line rating.<sup>21</sup>

**a. Filing**

13. PJM proposes to use the term “Thermal Transmission Facility Rating” rather than the term “Transmission Line Rating” from the *pro forma* OATT Attachment M.<sup>22</sup> PJM argues that the adjustment clarifies the defined term, is not a material change to the language proposed in Order No. 881, and promotes the use of a consistent defined term – Transmission Facility – across PJM’s Tariff, Operating Agreement, and the Consolidated Transmission Owners Agreement (CTOA). PJM further asserts that the term Thermal Transmission Facility Rating emphasizes that Order No. 881’s focus was on the implementation of enhancements to thermal ratings. PJM further explains that thermal ratings are distinct from system voltage and stability limits within PJM. PJM proposes not to include certain language in the *pro forma* OATT Attachment M definition of Transmission Line Rating adopted in Order No. 881 that it views as redundant (e.g., references to “thermal flow limits”) or not related to thermal ratings (e.g., references to technical limitations of the transmission system such as system

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<sup>18</sup> Proposed PJM Tariff, attach. W (3.0.0).

<sup>19</sup> *Supra* n.3.

<sup>20</sup> Order No. 881, 177 FERC ¶ 61,179 at P 45.

<sup>21</sup> *Id.* PP 40, 44-45.

<sup>22</sup> Filing, Transmittal Letter at 7. Similarly, PJM also proposes to use the term “Seasonal Facility Rating” instead of “Seasonal Line Rating.” *See* Proposed PJM Tariff, attach. W.

voltage and stability limits). Specifically, PJM proposes to modify the *pro forma* OATT Attachment M as follows:

“Thermal Transmission Line Facility Rating” means the maximum transfer capability of a Transmission ~~line~~ Facility, computed in accordance with a written Thermal Transmission Line Facility Rating methodology and consistent with Good Utility Practice, considering the technical limitations on conductors and relevant transmission equipment (~~such as thermal flow limits~~), as well as technical limitations of the ~~Transmission System (such as system voltage and stability limits)~~. Relevant transmission equipment may include, but is not limited to, circuit breakers, line traps, and transformers.<sup>23</sup>

**b. Commission Determination**

14. We find PJM’s proposed definition of Thermal Transmission Facility Rating partially complies with the *pro forma* OATT Attachment M definition of Transmission Line Rating.<sup>24</sup> We find that, consistent with the *pro forma* OATT Attachment M definition of Transmission Line Rating, PJM proposes to define a Thermal Transmission Facility Rating as the maximum transfer capability of a transmission facility, considering the technical limitations on conductors and relevant transmission equipment and reflects the fact that transmission line ratings must incorporate a set of electrical equipment ratings that collectively operate as a single bulk electric system element.<sup>25</sup>

15. However, we disagree with PJM’s argument that, because the focus of Order No. 881 was on enhancements to thermally limited lines, that justifies excluding the portion of the Transmission Line Rating definition that applies to voltage and stability-limited lines. Specifically, PJM has struck reference to “technical limitations of the Transmission System (such as system voltage and stability limits)” as part of its

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<sup>23</sup> Proposed PJM Tariff, attach. W.

<sup>24</sup> The Commission in Order No. 881 noted that some public utility transmission providers may have provisions in their existing *pro forma* OATTs or other documents subject to the Commission’s jurisdiction that the Commission has deemed to be consistent with or superior to the *pro forma* OATT. The Commission stated that, where these provisions would be modified by the final rule, transmission providers must either comply with the requirements adopted in the final rule or demonstrate that these previously approved variations continue to be consistent with or superior to the *pro forma* OATT, as modified by the final rule. Order No. 881, 177 FERC ¶ 61,179 at P 363.

<sup>25</sup> Order No. 881, 177 FERC ¶ 61,179 at P 44.

proposed definition of Thermal Transmission Facility Rating and has not proposed other definition(s) or provisions to address ratings based on such limits or identified existing tariff provisions that sufficiently address such ratings. PJM has not explained how its tariff will ensure that a transmission owner will develop such line ratings for non-thermally limited lines, as required by Order No. 881.<sup>26</sup> Thus, we find that PJM has not demonstrated that its proposed definition for Thermal Transmission Facility Rating is consistent with or superior to the definition of Transmission Line Rating established in Order No. 881. Accordingly, we direct PJM to file, within 60 days of the date of this order, a further compliance filing that proposes Tariff revisions to include consideration for the technical limitations of the transmission system (such as system voltage or stability limits) in their definition(s) and to require that line ratings based on such technical limitations be determined in accordance with a written line rating methodology and consistent with good utility practice, or to explain why it should not be required to do so. To the extent that PJM proposes a separate definition to address ratings based on technical limitations of the transmission system (such as system voltage or stability limits), PJM should also include that term wherever it has proposed to use the term “Thermal Transmission Facility Rating” and make any other necessary conforming revisions, or explain why it should not be required to do so.

16. Because we are otherwise accepting PJM’s proposed terminology, we hereinafter in this order use the terms “transmission facility” or “Thermal Transmission Facility Rating” when referring to PJM’s proposal in place of the terms “transmission line” or “transmission line rating.”

## 2. Ambient-Adjusted Ratings

### a. Use of AARs For Near-term Transmission Service

17. In Order No. 881, the Commission required transmission providers to use AARs when evaluating the availability of and requests for near-term transmission service<sup>27</sup> (under sections 15, 17, 18, and 29 of the *pro forma* OATT). Specifically, the Commission required transmission providers to use AARs as the relevant transmission line ratings when: (1) evaluating requests for near-term transmission service, defined as transmission service ending within 10 days of the date of the request; (2) responding to requests for information on the availability of potential near-term transmission service

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<sup>26</sup> *Id.*

<sup>27</sup> The Commission defined “requests for near-term transmission service” to include not only requests for near-term point-to-point transmission service, but also network resource designations and secondary service where the start and end date of the designation/request is within the next 10 days. Order No. 881, 177 FERC ¶ 61,179 at P 86.



(including requests for available transfer capability (ATC) or other information related to potential service); and (3) posting ATC or other information related to near-term transmission service to their OASIS site.<sup>28</sup>

18. Further, the Commission required transmission providers to use AARs as the relevant transmission line rating when determining whether to curtail or interrupt near-term point-to-point transmission service (under sections 13.6 and/or 14.7 of the *pro forma* OATT) if such curtailment or interruption is both necessary because of issues related to flow limits on transmission lines and anticipated to occur (start and end) within 10 days of such determination.<sup>29</sup> Similarly, the Commission required transmission providers to use AARs as the relevant transmission line ratings when determining whether to curtail network or secondary service (under section 33 of the *pro forma* OATT) or redispatch network or secondary service (under sections 30.5 and/or 33 of the *pro forma* OATT), if such curtailment or redispatch is both necessary because of issues related to flow limits on transmission lines and anticipated to occur (start and end) within 10 days of such determination.<sup>30</sup> The Commission further clarified that AARs must be used as the relevant transmission line rating when determining whether to initiate Transmission Loading Relief (TLR) procedures anticipated to occur (start and end) within the next 10 days.<sup>31</sup>

19. The Commission required that transmission providers – including RTOs/ISOs for transmission service at their seams – use AARs as the basis for evaluation of transmission service requests that will end within 10 days of the request.<sup>32</sup> The Commission stated that it would allow RTOs/ISOs to comply with these AAR requirements by revising their OATTs to require implementation of AARs within their security constrained economic dispatch and security constrained unit commitment models (and in any relevant related models) in both the day-ahead and real-time markets and reliability unit commitment processes,<sup>33</sup> and any other intra-day reliability unit commitment processes.<sup>34</sup> The

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<sup>28</sup> *Id.* P 86.

<sup>29</sup> *Id.* P 87.

<sup>30</sup> *Id.* P 88.

<sup>31</sup> *Id.* P 177.

<sup>32</sup> *Id.* P 4.

<sup>33</sup> *Id.* P 89.

<sup>34</sup> *See id.* P 89 n.213 (explaining the meaning of reliability unit commitment for purposes of the Final Rule).

Commission stated that, to the extent an RTO/ISO believes that AARs should not be used as part of any market process associated with the day-ahead and real-time markets (or that updated AARs should not be required for any market process), it should propose and justify such deviations on compliance.<sup>35</sup> However, the Commission further noted that RTOs/ISOs generally use the *pro forma* OATT transmission service model for movement of electricity into/out of their service territories.<sup>36</sup> Thus, the Commission required that, for transmission service at their seams, RTOs/ISOs must use AARs as the basis for evaluation of transmission service requests that will end within 10 days of the request, and as the basis for the determination of the necessity of curtailment, interruption, or redispatch of transmission service anticipated to occur within those 10 days.<sup>37</sup>

**i. Filing**

20. PJM asserts that it is already in partial compliance with the requirement in Order No. 881 “to use updated AARs as part of any market process associated with day-ahead and real-time markets.”<sup>38</sup> PJM explains that it currently uses set day and night temperature ratings for transmission facilities and states that it will be pursuing software changes needed in both the day-ahead and real-time market clearing engine systems to comply with Order No. 881 by July 2025.

**ii. Commission Determination**

21. We find that PJM’s proposal partially complies with the requirement in Order No. 881 for use of AARs in near-term transmission service. The Commission allowed RTOs/ISOs to comply with this requirement of Order No. 881 by revising their OATT to incorporate AARs in security constrained economic dispatch and security constrained unit commitment models (and in any relevant related models) in both the day-ahead and real-time markets and reliability unit commitment processes.<sup>39</sup> Although PJM explains that it will be pursuing software changes to ensure compliance by July 2025, PJM does not propose tariff revisions or identify existing tariff provisions that require implementation of AARs within its security constrained economic dispatch and security

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<sup>35</sup> *Id.* P 153.

<sup>36</sup> *Id.* P 134.

<sup>37</sup> *Id.* PP 4, 89.

<sup>38</sup> Filing, Transmittal Letter at 3 n.5 (citing Order No. 881, 177 FERC ¶ 61,179 at P 153).

<sup>39</sup> Order No. 881, 177 FERC ¶ 61,179 at P 134.

constrained unit commitment models in the day-ahead and real-time markets, as required in Order No. 881.<sup>40</sup>

22. Accordingly, we direct PJM to file, within 60 days of the date of this order, either a further compliance filing that proposes tariff provisions, or, in the alternative, a compliance filing that identifies tariff provisions that specify that PJM will use updated AARs as part of any market process associated with day-ahead and real-time markets.

**b. AAR Technical Details**

23. *Pro forma* OATT Attachment M, as adopted in Order No. 881, defines an AAR as a transmission line rating that: (1) applies to a time period of not greater than one hour; (2) reflects an up-to-date forecast of ambient air temperature across the time period to which the rating applies; (3) reflects the absence of solar heating during nighttime periods, where the local sunrise/sunset times used to determine daytime and nighttime periods are updated at least monthly, if not more frequently; and (4) is calculated at least each hour, if not more frequently.<sup>41</sup>

24. The Commission explained that, in order for an AAR to reflect an up-to-date forecast of ambient air temperature across the time period to which the rating applies, it must be valid for at least the range of historical temperatures plus or minus a margin of 10 degrees Fahrenheit.<sup>42</sup> In addition, the Commission stated that the AAR must update at least with every five-degree Fahrenheit increment of temperature change.<sup>43</sup>

25. With regard to transmission providers that choose to use “look-up tables” or similar pre-calculated databases, the Commission clarified that hourly (or more frequent) querying of “look-up tables” or similar pre-calculated databases will satisfy the requirement that AARs be calculated at least each hour.<sup>44</sup> The Commission further

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<sup>40</sup> *Id.* P 89.

<sup>41</sup> *Pro forma* OATT, attach. M, Definitions; *see also* Order No. 881, 177 FERC ¶ 61,179 at P 4.

<sup>42</sup> Order No. 881, 177 FERC ¶ 61,179 at P 185.

<sup>43</sup> *Id.* P 187; *see* Order No. 881-A, 179 FERC ¶ 61,125 at PP 48-51.

<sup>44</sup> Order No. 881, 177 FERC ¶ 61,179 at P 142.

clarified in Order No. 881-A that the five-degree granularity requirement does not affect the required timing of a transmission provider's recalculation of AARs.<sup>45</sup>

**i. Filing**

26. PJM proposes to use the verb “evaluate” in its proposed Attachment W rather than “calculate” as used in the *pro forma* OATT Attachment M to clarify cases where a look-up table is being used to arrive at a rating, as PJM asserts that it is not precise to say such a rating is being “calculated” in that instance.<sup>46</sup> Except for PJM’s proposal to replace “calculate” with “evaluate,” PJM proposes to adopt the *pro forma* AAR definition adopted in Order No. 881. Thus, PJM proposes to define an AAR as a Thermal Transmission Facility Rating that:

- (a) applies to a time period of not greater than one hour;
- (b) reflects an up-to-date forecast of ambient air temperature across the time period to which the rating applies; (c) reflects the absence of solar heating during nighttime periods, where the local sunrise/sunset times used to determine daytime and nighttime periods are updated at least monthly, if not more frequently; (d) is ~~calculated~~evaluated at least each hour, if not more frequently.<sup>47</sup>

**ii. Commission Determination**

27. We find that PJM’s proposal complies with the technical requirements in Order No. 881 related to AARs in near-term transmission service. We find that PJM’s proposed definition of an AAR is consistent with or superior to the *pro forma* Attachment M. By adopting the *pro forma* OATT Attachment M definition in part, PJM’s definition of AAR reflects that an AAR: (1) applies to a time period of not greater than one hour; (2) reflects an up-to-date forecast of ambient air temperature across the time period to which the rating applies; (3) reflects the absence of solar heating during nighttime periods, where the local sunrise/sunset times used to determine daytime and nighttime periods are updated at least monthly, if not more frequently.<sup>48</sup> In Order No. 881, the Commission clarified that hourly or more frequent querying of a look-up table or

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<sup>45</sup> Order No. 881-A, 179 FERC ¶ 61,125 at P 60.

<sup>46</sup> Filing, Transmittal Letter at 6-7.

<sup>47</sup> Proposed PJM Tariff, attach. W.

<sup>48</sup> *Id.*; *see also pro forma* OATT, attach. M, Definitions; *see also* Order No. 881, 177 FERC ¶ 61,179 at P 4.

pre-calculated AAR database will satisfy the requirement that AARs be calculated at least each hour.<sup>49</sup> PJM’s proposed use of “evaluate” is thus consistent with the term “calculate” in the *pro forma* OATT Attachment M AAR definition and accurately describes situations in which PJM uses look-up tables to calculate a rating. Accordingly, we accept PJM’s proposed definition of an AAR.

### 3. AAR Timelines

28. In discussing how new forecast data should be incorporated into AAR calculations, the Commission required transmission providers to explain their timelines for calculating or submitting AARs as part of their compliance filings.<sup>50</sup> The Commission noted that transmission providers already manage similar timing issues with respect to load forecasts, forecasts for renewable generation, and generation bid deadlines, and that it may be that the deadlines for AAR calculation and submission are not significantly different from existing deadlines for submission of updates to generation supply offers and load.

#### a. Filing

29. PJM does not explain its timelines for calculating or submitting AARs.

#### b. Commission Determination

30. We find that PJM does not comply with the requirement in Order No. 881 to explain its timelines for calculating or submitting AARs.<sup>51</sup> We recognize, however, that these timelines may not be determined until closer to AAR implementation and therefore that additional time may be necessary to comply with this requirement. Therefore, we direct PJM to file, no later than November 12, 2024, eight months prior to July 12, 2025, the implementation deadline directed by the Commission in Order No. 881,<sup>52</sup> a further compliance filing that provides this explanation.<sup>53</sup>

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<sup>49</sup> Order No. 881, 177 FERC ¶ 61,179 at P 142.

<sup>50</sup> *Id.* P 143.

<sup>51</sup> *See id.*

<sup>52</sup> *Id.* P 361.

<sup>53</sup> PJM should submit its compliance filing in an eTariff submittal using Type of Filing Code 80 – Compliance Filing in the above-referenced docket.

#### 4. **Role of the Transmission Owner and Transmission Provider in AAR Implementation**

31. In Order No. 881, the Commission clarified that transmission owners, not transmission providers, are responsible for calculating transmission line ratings.<sup>54</sup> The Commission noted that, because a distinction is made between transmission owners and transmission providers in RTO/ISO regions, RTOs/ISOs will need to rely on their member transmission owners to calculate transmission line ratings and provide them to the RTO/ISO in order to comply with Order No. 881.<sup>55</sup>

32. In instances where the transmission provider is not the transmission owner, such as in RTO/ISO regions, the Commission required that the transmission provider explain, in its compliance filing, the mechanism (e.g., a tariff or membership agreement) through which transmission owners will be obligated to make and communicate to the transmission provider the timely calculations and determinations related to transmission line ratings (including the exercise of any discretion in calculations or application of exceptions).<sup>56</sup> Further, the Commission required RTOs/ISOs on compliance to propose and justify a methodology for AAR implementation, delineating the expected roles between transmission owners and transmission provider.<sup>57</sup> In addition, the Commission required that electronic transmission line rating data be submitted by transmission owners directly into an RTO's/ISO's energy management system (EMS) through Supervisory Control and Data Acquisition (SCADA) or similar communications systems, such as Inter-Control Center Communication Protocol.<sup>58</sup>

##### a. **Filing**

33. In response to the Commission's directive to explain the mechanism through which transmission owners will be obligated to provide determinations related to transmission line ratings, PJM points to its CTOA and its Operating Agreement.<sup>59</sup> First, PJM cites section 4.11 of its CTOA, which provides that "[a]ll Parties shall regularly update and verify Transmission Facility ratings, subject to review and approval by PJM,

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<sup>54</sup> Order No. 881, 177 FERC ¶ 61,179 at P 140.

<sup>55</sup> *Id.* PP 140, 300.

<sup>56</sup> *Id.* P 141.

<sup>57</sup> *Id.* P 142.

<sup>58</sup> *Id.* P 179.

<sup>59</sup> Filing, Transmittal Letter at 6.

in accordance with the following procedures and the procedures in the PJM [Business Practice] Manuals[.]”<sup>60</sup> Second, PJM cites sections 11.3.1(b), (c) and 11.3.2(h) of its Operating Agreement, which generally require transmission owners to provide records and communications required for the coordination of its operations with PJM’s Office of the Interconnection; to provide trained personnel to enable timely supply of records and data to PJM; and to adopt and apply the standards in PJM’s tariff and manuals for system design, equipment ratings, operating practices, and maintenance practices.<sup>61</sup>

34. Regarding the Commission’s directive that requires transmission owners submit electronic transmission line rating data directly to the RTO’s EMS, PJM cites its CTOA and Business Practice Manuals. Specifically, PJM highlights section 4.9 of the CTOA, which requires that transmission owners “comply with the data, information and metering requirements established by PJM, as reflected in the PJM [Business Practice] Manuals.”<sup>62</sup> PJM further states that PJM Manual 31, section 3.3 and Appendix A require transmission owners to enter ratings data into the Thermal Equipment Ratings Monitor in eDART, PJM’s Dispatcher Application and Reporting Tool, which is then transferred to the EMS model.<sup>63</sup>

35. PJM adopts the *pro forma* OATT Attachment M language on the Obligations of Transmission Provider, with minor deviations. Specifically, PJM’s proposed Attachment W adds PJM’s Office of the Interconnection to the list of entities that can develop forecasts of ambient air temperature for AARs and Seasonal Facility Ratings contra the *pro forma* OATT Attachment M, which only mentions the Transmission Owner.<sup>64</sup> In response to the Commission’s directive that requires RTOs/ISOs to propose and justify a methodology for AAR implementation, PJM states that it will continue to collaborate with its stakeholders to finalize the documentation of a methodology for AAR implementation that delineates the expected roles between PJM and PJM Transmission

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<sup>60</sup> PJM, Rate Schedules, Consolidated Transmission Owners Agreement, art. 4.11 (Transmission Facility Ratings) (0.0.0).

<sup>61</sup> PJM, Intra-PJM Tariffs, Operating Agreement, § 11.3 (Member Responsibilities) (5.0.0).

<sup>62</sup> Filing, Transmittal Letter at 6, n.12 (citing PJM, Rate Schedules, Consolidated Transmission Owners Agreement, art. 4.9 Data, Information and Metering (0.0.0)).

<sup>63</sup> *Id.* (citing PJM Manual 3A, § 3.3 PJM Ratings Data (Thermal Equipment Ratings Monitor – TERM), app. A eDart Application Functionality Training (including Network Model and TERM Applications)).

<sup>64</sup> Proposed PJM Tariff, attach. W.

Owners.<sup>65</sup> PJM states that, in addition to any potential future filings identified as necessary over the next three years, PJM proposes to make an informational filing with the Commission when it has finalized such a methodology.

**b. Comments**

36. In its comments, ODEC requests clarity on two issues. First, ODEC argues that PJM should clarify its proposal for transmission line rating calculations.<sup>66</sup> ODEC explains that PJM currently uses, and ODEC believes PJM will continue to use, rating set look-up tables for AARs that are supplied by the individual transmission owners even though PJM's proposal does not discuss the use of rating set look-up tables.<sup>67</sup> ODEC states that it does not believe that PJM needs to revise its proposed Attachment W but asserts that clarifying PJM's use of look-up tables will facilitate PJM's compliance. ODEC requests that PJM clarify its intent to continue to permit the individual transmission owners to submit rating set look-up tables that will be used by PJM for determining the AAR Thermal Transmission Facility Ratings and Seasonal Facility Ratings. Second, ODEC requests that the Commission confirm PJM's continued use of rating set look-up tables complies with Order No. 881.<sup>68</sup>

**c. Commission Determination**

37. We find that PJM's proposed implementation partially complies with Order No. 881. PJM points to relevant CTOA and Operating Agreement provisions that, together, satisfy the Commission's directive to explain the mechanism by which transmission owners will be obligated to make and communicate to the transmission provider the timely calculations and determinations related to transmission line ratings. Additionally, PJM points to relevant tariff and manual provisions that satisfy the Commission's requirement that transmission owners submit electronic transmission line rating data directly into the RTO's EMS, citing to its CTOA and PJM's Business Practice Manuals.

38. With regard to PJM's proposal to allow itself or a transmission owner to develop forecasts of ambient air temperature for AARs and Seasonal Facility Ratings, the Commission recognized in Order No. 881 that in RTO/ISO regions where there is a distinction between transmission owners and transmission providers, additional

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<sup>65</sup> Filing, Transmittal Letter at 3-4.

<sup>66</sup> ODEC Comments at 3-4.

<sup>67</sup> *Id.* at 4.

<sup>68</sup> *Id.* at 4-5.



clarification may be needed to account for the fact that transmission owners, not transmission providers, are responsible for calculating transmission line ratings.<sup>69</sup> Because PJM provides additional clarification regarding responsibilities for developing forecasts for ambient air temperature for AARs and seasonal line ratings, we find that PJM's proposal is consistent with or superior to the *pro forma* OATT Attachment M. Accordingly, we accept PJM's proposed Tariff revisions related to role of transmission owners and transmission providers.

39. However, we find that PJM's statement that it will continue to collaborate with stakeholders to finalize the documentation of a methodology for AAR implementation that delineates the expected roles between PJM and PJM Transmission Owners does not comply with the requirement in Order No. 881 to propose and justify a methodology for AAR implementation, delineating expected roles between transmission owners and transmission provider, on compliance.<sup>70</sup> Accordingly, we direct PJM to file, within 60 days of the date of this order, a compliance filing that proposes and justifies a methodology for AAR implementation, delineating the expected roles between transmission owners and PJM. In making this compliance filing, PJM should respond to ODEC's request that PJM clarify its intent regarding the continued use of look-up tables.<sup>71</sup>

40. With regard to ODEC's request that the Commission confirm PJM's continued use of look-up tables complies with Order No. 881,<sup>72</sup> the Commission explained that "hourly (or more frequent) querying of 'look-up tables' or similar pre-calculated AAR databases will satisfy the requirement that AARs be calculated at least each hour."<sup>73</sup> Accordingly, if PJM chooses to use look-up tables, such choice would comply with Order No. 881, provided these tables are queried at least hourly.

## 5. Exceptions and Alternate Ratings

41. In Order No. 881, the Commission adopted exceptions to the AAR and seasonal line rating requirements for both near-term and longer-term transmission service for two sets of circumstances, set forth in the *pro forma* OATT Attachment M.

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<sup>69</sup> Order No. 881, 177 FERC ¶ 61,179 at P 140.

<sup>70</sup> *Id.* P 142.

<sup>71</sup> ODEC Comments at 3-4.

<sup>72</sup> *Id.* at 4-5.

<sup>73</sup> Order No. 881, 177 FERC ¶ 61,179 at P 142.

42. First, where a transmission provider determines, consistent with good utility practice, that a transmission line rating of a transmission line is not affected by ambient air temperature or solar heating, the transmission provider may use a transmission line rating that is not an AAR or seasonal line rating.<sup>74</sup> According to *pro forma* OATT Attachment M, examples of such a transmission line may include: (1) a transmission line for which the technical transfer capability of the limiting conductors and/or limiting transmission equipment is not dependent on ambient air temperature or solar heating; or (2) a transmission line whose transfer capability is limited by a Transmission System limit (such as a system voltage or stability limit) which is not dependent on ambient air temperature or solar heating.<sup>75</sup> The Commission required that, if the technical basis for such an exception changes, then the transmission provider must update the relevant transmission line ratings in a timely manner.<sup>76</sup> The Commission further required transmission providers to reevaluate any such exceptions at least every five years.<sup>77</sup>

43. Second, the Commission established an option for transmission providers to temporarily use a different transmission line rating from that which would otherwise be required by *pro forma* OATT Attachment M in instances when the transmission provider reasonably determines, consistent with good utility practice, that the use of such a temporary alternate rating is necessary to ensure the safety and reliability of the transmission system.<sup>78</sup>

**a. Filing**

44. PJM proposes to adopt the *pro forma* OATT Attachment M language related to exceptions and alternate ratings, with a few modifications. First, PJM proposes to use the term “Temporary Conditional Thermal Transmission Facility Ratings,” which it contends further enhances and clarifies Order No. 881’s terminology to “temporary” and “alternative” ratings, and “temporary alternative ratings.”<sup>79</sup> PJM argues the proposed adjustment clarifies that a temporary rating is short-term in duration and is expressly conditioned upon the need to ensure the safety and reliability of the transmission system

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<sup>74</sup> *Id.* P 227.

<sup>75</sup> *Pro forma* OATT, attach. M, Obligations of Transmission Provider; *see also* Order No. 881, 177 FERC ¶ 61,179 at P 227.

<sup>76</sup> Order No. 881, 177 FERC ¶ 61,179 at P 233.

<sup>77</sup> *Id.* PP 233, 342.

<sup>78</sup> *Id.* P 228.

<sup>79</sup> Filing, Transmittal Letter at 8.

as a limiting trigger.<sup>80</sup> Similarly, PJM proposes to replace the “System Reliability” heading in *pro forma* Attachment M with: “Use of a Temporary Conditional Thermal Transmission Facility Ratings to Ensure Safety and Reliability of the Transmission System (System Reliability),” which it contends is a more descriptive heading.<sup>81</sup>

45. Second, PJM proposes to have the transmission owner determine where a Thermal Transmission Facility Rating is not affected by ambient air temperature or solar heating, and allow itself or a transmission owner to use a Thermal Transmission Facility Rating for that transmission facility that is not an AAR or a Seasonal Facility Rating in such instances. PJM proposes to require the entity that makes the exception determination to post it to PJM’s database of facility ratings. PJM further proposes to require the transmission owner update the Thermal Transmission Facility Ratings and reevaluate any exceptions at least every five years. Specifically, PJM proposes the following modifications to *pro forma* OATT Attachment M:

Where the Transmission ~~Provider~~Owner determines, consistent with Good Utility Practice, that the Thermal Transmission LineFacility Rating of a Transmission ~~line~~Facility is not affected by ambient air temperature or solar heating, the Office of the Interconnection and Transmission ~~Provider~~Owner may use a Thermal Transmission LineFacility Rating for that ~~transmission line~~Transmission Facility that is not an AAR or Seasonal LineFacility Rating... The ~~Transmission Provider~~entity that makes this determination must document in ~~its~~the Office of the Interconnection’s database of Thermal Transmission LineFacility Ratings and Thermal Transmission LineFacility Rating methodologies on OASIS or another password-protected website any exceptions... If the technical basis for an exception under this paragraph changes, then the Transmission ~~Provider~~Owner must update the relevant Thermal Transmission LineFacility Rating(s) in a timely manner. The Transmission ~~Provider~~Owner must reevaluate any exceptions taken under this paragraph at least every five years.<sup>82</sup>

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<sup>80</sup> *Id.*

<sup>81</sup> PJM proposes to substitute “Use of a Temporary Conditional Thermal Transmission Facility Rating to Ensure the Safety and Reliability of the Transmission System” for “System Reliability.” *Id.* at 8 n. 14; Proposed PJM Tariff, attach. W.

<sup>82</sup> Proposed PJM Tariff, attach. W.

46. Third, PJM proposes to allow itself or the transmission owner to determine when a temporary alternate rating should be used to ensure the safety and reliability of the transmission system. PJM similarly proposes to require the entity that makes this determination to post it to PJM's database of facility ratings and to include the nature and basis for this temporary rating. Specifically, PJM proposes the following modifications to *pro forma* OATT Attachment M:

If the ~~Transmission Provider~~ Office of the Interconnection or Transmission Owner reasonably determines, consistent with Good Utility Practice, that the temporary conditional use of a Thermal Transmission Line Facility Rating different than would otherwise be required by this Attachment is necessary to ensure the safety and reliability of the Transmission System, then the Office of the Interconnection or Transmission Provider Owner may use such an alternate temporary conditional rating. The ~~Transmission Provider~~ entity that makes this determination must document in ~~its~~ the Office of the Interconnection's database of ~~Transmission Line Ratings and Thermal Transmission Line Facility Ratings and Thermal Transmission Facility Rating~~ methodologies on OASIS or another password-protected website, as required by this Attachment, the use of an alternate Thermal Transmission Line Facility Rating under this paragraph, including the nature of and basis for the ~~alternate~~ temporary conditional rating, the date and time that the alternate rating was initiated, and (if applicable) the date and time that the alternate rating was withdrawn and the standard rating became effective again.<sup>83</sup>

**b. Commission Determination**

47. We find that PJM's proposed Tariff revisions related to exceptions and alternate ratings are consistent with or superior to those required under Order No. 881 and therefore accept them. First, we find that PJM's proposed use of the phrase "Temporary Conditional Thermal Transmission Facility Ratings" is consistent with or superior to the *pro forma* OATT Attachment M use of "temporary" and "alternative" ratings, and "temporary alternative ratings" because it captures that the rating is temporary and short-term in duration. Similarly, we find that PJM's proposal to use a "Use of a Temporary Conditional Thermal Transmission Facility Ratings to Ensure the Safety and Reliability of the Transmission System (System Reliability)" heading in its Tariff

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<sup>83</sup> *Id.*

Attachment W is consistent with or superior to the *pro forma* OATT Attachment M heading of “System Reliability” because it conveys that the section deals with temporary ratings to ensure system reliability. Finally, with regard to PJM’s proposal to divide the responsibilities for determining when to use a transmission line rating that is not an AAR or seasonal line rating and when to use a temporary rating, the Commission recognized in Order No. 881 that in RTO/ISO regions where there is a distinction between transmission owners and transmission providers, additional clarification may be needed to account for the fact that transmission owners, not transmission providers, are responsible for calculating transmission line ratings.<sup>84</sup> Because PJM provides additional clarification regarding responsibilities for determining exceptions and when to use a temporary alternate rating, we find that PJM’s proposal is consistent with or superior to the *pro forma* OATT Attachment M. Accordingly, we accept PJM’s proposed Tariff revisions related to exceptions and alternate ratings.

## 6. Dynamic Line Ratings

48. In Order No. 881, the Commission required RTOs/ISOs to establish and maintain systems and procedures necessary to allow transmission owners to electronically update transmission line ratings (for each period for which transmission line ratings are calculated) at least hourly, with such data submitted by transmission owners directly into the RTO’s/ISO’s EMS through SCADA or related systems. The Commission noted that, without these capabilities, RTO/ISO software could serve as a barrier that prevents transmission owners in RTOs/ISOs from implementing dynamic line ratings (DLRs).<sup>85</sup>

### a. Filing

49. PJM explains that it has already made significant progress toward PJM’s readiness to implement DLRs, in compliance with Order No. 881, and that it plans to continue stakeholder engagement to ensure it is able to accept DLRs by July 2025.<sup>86</sup>

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<sup>84</sup> Order No. 881, 177 FERC ¶ 61,179 at P 140.

<sup>85</sup> *Id.* P 255. A DLR is “a transmission line rating that applies to a time period of not greater than one hour and reflects up-to-date forecasts of inputs such as (but not limited to) ambient air temperature, wind, solar heating intensity, transmission line tension, or transmission line sag.” 18 C.F.R. § 35.28(b)(14) (2022); *see also id.* PP 235, 238.

<sup>86</sup> Filing, Transmittal Letter at 4.

**b. Commission Determination**

50. As PJM has noted, it has already made significant progress towards being able to accept DLRs from transmission owners that elect to use them. We remind PJM that however it chooses to accept DLRs, it must meet at least the minimum capabilities outlined by the Commission in Order No. 881. Specifically, PJM's method must allow transmission owners to electronically update transmission line ratings at least hourly, with such data submitted by transmission owners directly into PJM's EMS through SCADA or related systems.<sup>87</sup>

**7. Transparency**

**a. Transmission Providers Sharing Transmission Line Ratings and Methodologies with Any Transmission Provider(s) Upon Request**

51. In Order No. 881, the Commission required transmission providers to share transmission line ratings and transmission line rating methodologies with any transmission provider(s) upon request and in a timely manner.<sup>88</sup> While the Commission did not require a specific information sharing method, the Commission clarified that any such information sharing method should be sufficient to accommodate the reasonable business needs of the other transmission provider(s) (e.g., to allow the other transmission provider(s) to process transmission service requests in a timely manner).<sup>89</sup>

**i. Filing**

52. PJM's proposed Attachment W requires PJM to share, upon request from another Commission-approved RTO or ISO and in a timely manner, the following information: (1) Thermal Transmission Facility Ratings for each period for which Thermal Transmission Facility Ratings are evaluated, with updated ratings shared each time Thermal Transmission Facility Ratings are evaluated; and (2) Written Transmission Owner Thermal Transmission Facility Rating methodologies used in arriving at the Thermal Transmission Facility Ratings in (1) above.<sup>90</sup> PJM asserts that its use of "Commission-approved RTO or ISO" clarifies the term "Transmission Provider" in the *pro forma* OATT Attachment M because it relates to other RTOs or ISOs who may not

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<sup>87</sup> 18 C.F.R. § 35.28(g)(13)(i); Order No. 881, 177 FERC ¶ 61,179 at P 255.

<sup>88</sup> Order No. 881, 177 FERC ¶ 61,179 at PP 330, 335.

<sup>89</sup> *Id.* P 335.

<sup>90</sup> Proposed PJM Tariff, attach. W.

be the transmission owner's own transmission provider but instead could be a neighbor system working with PJM and its Transmission Owners.<sup>91</sup> Specifically, PJM proposes the following modifications to the *pro forma* OATT Attachment M regarding information sharing:

Sharing with other Commission-Approved Regional Transmission Providers~~Organizations or Independent System Operators~~: The ~~Transmission Provider~~Office of the Interconnection must share, upon request ~~by any~~from another Commission-approved Regional Transmission Provider~~Organization or Independent System Operator~~...<sup>92</sup>

## ii. Commission Determination

53. We find that PJM's proposal partially complies with the information sharing requirements of Order No. 881. Although PJM proposes to share transmission line ratings and methodologies with other RTOs/ISOs, Order No. 881 required transmission providers to share ratings and methodologies with all transmission providers. As the Commission found in Order No. 881, the requirement to share ratings and methodologies with other transmission providers is necessary because transmission operators often consider the effect that power flows on their transmission lines will have on other transmission providers' transmission lines, and transmission providers will need transmission line ratings on other systems to evaluate these effects properly.<sup>93</sup> The Commission did not apply this reasoning solely to RTOs/ISOs. Therefore, we direct PJM to file, within 60 days of the date of this order, a further compliance filing that proposes Tariff revisions stating that it will make this information available to any transmission provider upon request, or explain why it should not be required to do so.

## 8. Miscellaneous Issue

### a. Filing

54. PJM proposes some adjustments from the *pro forma* OATT Attachment M, to clarify the meaning of Transmission Provider. Specifically, PJM proposes to use the term "Office of the Interconnection" instead of the term "Transmission Provider" as used in the *pro forma* OATT Attachment M, and explains that the Office of the

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<sup>91</sup> Filing, Transmittal Letter at 5.

<sup>92</sup> Proposed PJM Tariff, attach. W.

<sup>93</sup> Order No. 881, 177 FERC ¶ 61,179 at P 335.

Interconnection refers to PJM.<sup>94</sup> PJM states that the Commission recognized in Order No. 881 that additional clarifications on the *pro forma* OATT Attachment M's use of Transmission Provider may be needed in the RTO/ISO regions because there is a distinction between transmission owners and transmission providers in RTO/ISO regions.<sup>95</sup>

**b. Commission Determination**

55. We find that PJM's proposal to use the term "Office of the Interconnection" in place of "Transmission Provider" is consistent with or superior to the *pro forma* Attachment M. We find that PJM's proposed term "Office of the Interconnection" specifies the office within PJM that will implement the transmission provider's role in compliance with Order No. 881 and therefore provides clarity to all parties. Accordingly, we accept PJM's proposal to use the term "Office of the Interconnection" in place of "Transmission Provider."

The Commission orders:

(A) PJM's compliance filing is hereby accepted, effective as requested, subject to further compliance, as discussed in the body of this order.

(B) PJM is hereby directed to submit a further compliance filing, within 60 days of the date of issuance of this order, as discussed in the body of this order.

(C) PJM is hereby directed to submit a further compliance filing, no later than November 12, 2024, explaining its AAR timelines, as discussed in the body of this order.

By the Commission.

( S E A L )

Kimberly D. Bose,  
Secretary.

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<sup>94</sup> Proposed PJM Tariff, attach. W.

<sup>95</sup> *Id.* (citing *e.g.* Order No. 881, 177 FERC ¶ 61,179 at P 140).