166 FERC ¶ 61,015
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Neil Chatterjee, Chairman;
Cheryl A. LaFleur, Richard Glick,
and Bernard L. McNamee.

PJM Interconnection, L.L.C. Docket No. ER19-323-000

ORDER ACCEPTING TARIFF REVISIONS

(Issued January 8, 2019)

1. On November 9, 2018, pursuant to section 205 of the Federal Power Act (FPA),[1] and section 35 of the Commission's regulations,[2] PJM Interconnection, L.L.C. (PJM) filed proposed revisions to PJM's Open Access Transmission Tariff (Tariff) and the Amended and Restated Operating Agreement of PJM (Operating Agreement). The proposed revisions: (1) specify the circumstances under which the transmission constraint penalty factor may be used to determine the marginal value[3] of a transmission constraint; (2) provide the default transmission constraint penalty factor values; and (3) explain the procedure for temporarily changing the default transmission constraint penalty factor values. In this order, we accept PJM's proposed tariff revisions, effective February 1, 2019, as requested.

I. Background

2. Pursuant to Attachment K-Appendix of the Tariff, PJM determines the least costly means of serving load and meeting reserve requirements at different locations in the PJM region based on, among other things, energy offers of market participants and the actual

[1] 16 U.S.C. § 824d (2012).

[2] 18 C.F.R. § 35 (2018).

[3] PJM proposes to define marginal value as "the incremental change in system dispatch costs, measured as a $/MW value incurred by providing one additional MW of relief to the transmission constraint." PJM Transmittal at n.3.

operating conditions of the system, including any binding transmission constraints.[4] PJM utilizes its real-time security-constrained economic dispatch (SCED) application to re-dispatch resources that can relieve a transmission constraint.[5]

3. In Order No. 844, the Commission stated that a lack of transparency with respect to transmission constraint penalty factors may result in unjust and unreasonable rates.[6] The Commission reasoned that a lack of transparency prevents market participants from understanding the impact of these factors on Locational Marginal Prices (LMPs).[7] As a result, the Commission required that each regional transmission organization (RTO) and independent system operator (ISO) include in its tariff: its transmission constraint penalty factor values; the circumstances, if any, under which the transmission constraint penalty factors can set LMPs; and the procedure, if any, for temporarily changing the transmission constraint penalty factor values.[8] Order No. 844 also required that any procedures for temporarily changing transmission constraint penalty factor values provide notice of the change to market participants as soon as practicable.

II. PJM's Filing

4. As stated above, PJM's proposed revisions: (1) specify the circumstances under which the transmission constraint penalty factor may be used to determine the marginal value of a transmission constraint; (2) provide the default transmission constraint penalty factor values; and (3) explain the procedure for temporarily changing the default transmission constraint penalty factor values. PJM states that this filing also is intended to satisfy PJM's outstanding compliance requirement to include certain rules pertaining to transmission constraint penalty factors in PJM's governing documents pursuant to Order No. 844.

5. With respect to the first part of its proposal, PJM states that to develop re-dispatch recommendations, its SCED application considers several parameters, including

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[4] PJM Tariff, Attachment K-Appendix, § 2.2.

[5] PJM Tariff, Attachment K-Appendix, § 2.2.

[6] *See Uplift Cost Allocation and Transparency in Markets Operated by Regional Transmission Organizations or Independent System Operators*, Order No. 844, 163 FERC ¶ 61,041, at P 27 (2018).

[7] Order No. 844 at P 121.

[8] *Id.* at P 121.

transmission constraint penalty factors.[9] PJM maintains that, occasionally, a transmission constraint cannot be controlled either because there are no resources available to solve the constraint or because the cost of re-dispatch is greater than the transmission constraint penalty factor value.[10] PJM explains that, in these situations, SCED currently applies constraint relaxation logic,[11] which increases the limit of the constrained transmission facility by the amount of excess flow. PJM states that constraint relaxation logic produces a solution that uses resources at a cost below the transmission constraint penalty factor and results in a reduced marginal value.[12]

6. PJM argues that constraint relaxation logic prevents the transmission constraint penalty factor from setting the marginal value of a transmission constraint and, therefore, that the use of this logic produces LMPs that can understate the severity of the transmission constraint. PJM asserts that the resulting LMP does not provide the transparent price signals necessary to inform transmission and generation investment decisions.[13]

7. PJM proposes to remove constraint relaxation logic and allow the transmission constraint penalty factor to set the marginal value for a transmission constraint when the SCED application cannot produce a solution that manages the flow on a transmission constraint within the limit of the transmission constraint.[14]

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[9] PJM Transmittal at 3. Transmission constraint penalty factors represent the maximum re-dispatch price that the system will pay before allowing flows to exceed a given transmission element's limit. *See* Order No. 844 at P 20.

[10] *Id.* at 3.

[11] PJM proposes to define constraint relaxation logic as "the logic applied in the market clearing software where the transmission limit is increased to prevent the Transmission Constraint Penalty Factor from setting the Marginal Value of a transmission constraint." *Id.* at n.4.

[12] *Id.* at 3.

[13] *Id.* at 4.

[14] PJM clarifies that, while the transmission constraint penalty factor used in the real-time market will set the marginal value, the transmission constraint penalty factor used in the day-ahead market is solely used to ensure a feasible market clearing solution and never intended to set the marginal value. *Id.* at n.10.

8. PJM proposes Tariff revisions that describe how the transmission constraint penalty factor is reflected in LMP.[15] PJM explains that the proposed revisions reference Tariff, Attachment K – Appendix, sections 2.5 through 2.6, to describe how the marginal value is used as one factor in determining LMP.[16] PJM clarifies that the transmission constraint penalty factor is used to determine the marginal value of a transmission constraint, which itself is an input in determining the congestion price component of LMP.

9. PJM states that it will allow the transmission constraint penalty factor to set the marginal value of a transmission constraint, including for market-to-market congestion management protocols.[17] PJM clarifies that, in certain limited instances, PJM will retain the ability to use constraint relaxation logic for market-to-market congestion management to accommodate potential requests from an adjacent RTO.[18] PJM states that the use of constraint relaxation logic for market-to-market congestion management would be used sparingly and would only occur upon mutual agreement between PJM and the relevant adjacent RTO, in accordance with the Joint Operating Agreements (JOAs).[19] PJM explains that, absent mutual agreement, the transmission constraint penalty factor would set the marginal value of market-to-market transmission constraints. PJM states that it expects to use constraint relaxation logic for market-to-market congestion management with Midcontinent Independent System Operator, Inc. (MISO) until the second quarter of 2019, when MISO will update its market clearing engine to allow transmission constraint penalty factors to set the marginal value of the transmission constraint in its markets.[20]

10. PJM also proposes to incorporate the existing default transmission constraint penalty factor values into the Tariff.[21] PJM states that the default transmission constraint penalty factor used in the real-time energy market is $2,000/MWh for transmission constraints located within the metered boundaries of the PJM region and $1,000/MWh for market-to-market coordinated transmission constraints located within the metered

[15] *Id.* at 6.

[16] *Id.* at 6.

[17] *Id.* at 7.

[18] *Id.* at 7-8.

[19] *Id.* at 8.

[20] *Id.* at 8, n.17.

[21] *Id.* at 8.

boundaries of the PJM region. Further, PJM states that the default transmission constraint penalty factor used in the day-ahead energy market is $30,000/MWh. PJM explains that these default values are set high enough to ensure that the market software considers all physically available dispatch options and available units to satisfy the transmission network's limits.[22] PJM notes that these values are based on historical data and experience.[23]

11. PJM also proposes Tariff revisions that specify its procedures for modifying the default transmission constraint penalty factor values.[24] PJM explains that adjustments may be needed periodically to reflect persistent system operational or reliability needs, changes in the costs of resources available to relieve congestion, changes to operating practices for managing market-to-market coordinated constraints, and the unique attributes of certain transmission facilities.[25]

12. PJM clarifies that it may raise the transmission constraint penalty factor when an insufficient amount of relief can be provided by resources at a cost below the default transmission constraint penalty factor, which would result in the flow on a constraint that is above or near the binding limit. PJM explains that, under these conditions, PJM may increase the penalty factor if there are available resources with a $/MW cost above the default transmission constraint penalty factor that can provide additional relief. [26]

13. PJM states that it may lower the transmission constraint penalty factor when sufficient congestion relief on the constraint can be provided by available resources at a cost below the default transmission constraint penalty factor, in order to prevent a high cost resource that cannot provide material congestion relief on the constraint from inappropriately setting the marginal value of the constraint.[27]

14. PJM states that, when an adjustment to the default transmission constraint penalty factor is required, PJM conducts real-time evaluations of the resources that are available

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[22] *Id.* at 9 (citing Horger Affidavit at ¶ 7).

[23] *Id.* at 10 (citing Horger Affidavit at ¶ 6).

[24] *Id.* at 15.

[25] *Id.* at 11.

[26] *Id.* at 12.

[27] *Id.* at 13.

to provide the necessary congestion relief (expressed in $/MW).[28] Further, PJM states that these evaluations consider estimates for the resource's incremental cost, the distribution factor on the constraint, and the overall system energy cost. PJM explains that consideration of these estimated values is necessary to avoid numerous adjustments to the transmission constraint penalty factor values within a short period of time as system conditions change throughout the day.[29]

15. PJM proposes to post adjusted transmission constraint penalty factor values as soon as practicable when the default values are modified.[30] PJM notes that it intends to post modified transmission constraint penalty factors no later than the following business day but declines to specify a deadline in the proposed Tariff revisions. PJM asserts that excluding a self-imposed deadline will provide PJM with sufficient flexibility in the event that an unforeseen circumstance arises that prevents modified values from being posted within such a deadline.[31]

16. PJM proposes an effective date of February 1, 2019 for the proposed Tariff and Operating Agreement revisions to ensure that the necessary changes to the market clearing engines will be made in time to allow transmission constraint penalty factors to set the marginal value of a transmission constraint, rather than the marginal value being set by the current practice of applying constraint relaxation logic.[32]

III. Notice of Filing and Responsive Pleadings

17. Notice of PJM's November 9, 2018 filing was published in the *Federal Register*, 83 Fed. Reg. 57,723 (2018), with interventions and protests due on or before November 30, 2018. Timely motions to intervene were filed by LS Power Associates, L.P., NRG Power Marketing LLC, Dominion Energy Services, Inc., East Kentucky Power Cooperative, Inc., Exelon Corporation, American Municipal Power, Inc. and FirstEnergy Service Company.

[28] *Id.* at 14.

[29] *Id.* at 14.

[30] *Id.* at 15.

[31] *Id.* at 16.

[32] *Id.* at 17.

18. Comments were filed by Monitoring Analytics, LLC, acting in its capacity as the Independent Market Monitor for PJM (IMM).

A. The IMM's Comments

19. The IMM generally supports PJM's proposed revisions. The IMM states that PJM's proposal to allow transmission constraint penalty factors to set the marginal value of a transmission constraint would result in LMPs that accurately reflect the underlying supply and demand conditions on the system due to a shortage of transmission capacity.[33] The IMM also raises three concerns with PJM's proposed revisions, as discussed below.

20. First, the IMM argues that PJM should set a deadline for providing notice of changes to transmission constraint penalty factor values to provide greater transparency to market participants.[34] The IMM states that Order No. 844 required RTOs/ISOs to post changes to default transmission constraint penalty factor values in a timely manner in order to allow market participants to hedge transactions and raise concerns regarding the RTO's/ISO's practices through the stakeholder process.[35]

21. Second, the IMM argues that PJM should not use constraint relaxation logic for any constraints, including market-to-market constraints.[36] The IMM states that PJM's proposal to use constraint relaxation logic in certain circumstances for coordinated market-to-market constraints deviates from efficient pricing principles. The IMM asserts that PJM should not accommodate the inefficient pricing practices of a neighboring RTO.[37]

22. Third, the IMM states that PJM should continue its efforts to adequately value the cost of violating a transmission constraint by defining the appropriate level for transmission constraint penalty factors.[38] The IMM argues that the default transmission constraint penalty factor values should take into account other system constraints, including the RTO-wide reserve penalty factors. In support of its argument, the IMM

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[33] IMM Comments at 1.

[34] *Id.* at 5-6.

[35] *Id.* at 5.

[36] *Id.* at 6.

[37] *Id.* at 7.

[38] *Id.* at 7.

states that the SCED application currently considers all tradeoffs between transmission constraints and reserve requirements.[39]

IV. Discussion

A. Procedural Matters

23. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2018), the timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding.

B. Substantive Matters

24. As discussed below, we find that PJM's proposed revisions are just and reasonable, and, accordingly, we accept the revisions effective February 1, 2019, as requested. The proposed revisions will provide transparency regarding PJM's transmission constraint penalty factor procedures and also produce more transparent and appropriate pricing and investment signals that correspond to an underlying transmission constraint.

25. We agree that Order No. 844 sought to provide transparency on an RTO's process for changing its transmission penalty factor values. However, we disagree with the IMM's view that PJM must specify in its Tariff a deadline for posting changes to default transmission constraint penalty factors. While Order No. 844 requires that "any procedures for temporarily changing transmission constraint penalty factor values must provide for notice of the change to market participants as soon as practicable," the rule does not articulate a specific deadline.[40] We find that PJM's proposal to post these changes as soon as practicable provides market participants with transparency regarding PJM's transmission constraint penalty factor practices, which affect LMPs.

26. We also disagree with the IMM's assertion that PJM should not use its constraint relaxation logic in limited circumstances for market-to-market coordinated constraints. PJM's proposal is consistent with the JOAs between MISO and PJM and between the New York Independent System Operator, Inc. (NYISO) and PJM, each of which requires the RTOs/ISOs to resolve price differences and send consistent economic signals to

[39] *Id.* at 7.

[40] Order No. 844, 163 FERC ¶ 61,041 at P 121.

market participants in both regions.[41] Specifically, the currently-effective JOAs provide that the RTOs/ISOs may employ constraint relaxation logic during situations where one of the RTOs/ISOs does not have sufficient re-dispatch to manage a market-to-market constraint.[42] Because the use of constraint relaxation logic results in price divergence at the seam of two adjacent RTOs, the JOAs also allow the RTOs to deactivate the constraint relaxation logic.[43] Further, PJM expects to use constraint relaxation logic on a limited basis and only upon mutual agreement between PJM and the relevant adjacent RTO.[44] With respect to market-to-market operations between PJM and MISO, PJM also explains that MISO expects to allow transmission constraint penalty factors to set the marginal value of the transmission constraints that are subject to market-to-market congestion management protocols once MISO completes the required software update in the second quarter of 2019.[45] We, therefore, find that it is appropriate to provide PJM flexibility to use its constraint relaxation logic in limited circumstances for market-to-market coordinated constraints.

27. Lastly, in response to the IMM's arguments, we find that it is not necessary to require here that the default transmission constraint penalty factor values explicitly take into account other system constraints, including the RTO-wide reserve penalty factors. Establishing the default transmission constraint penalty factor values based on historical evidence, as PJM proposes, ensures that the SCED application considers all physically available dispatch options and available units to resolve binding transmission constraints. PJM also retains the ability to modify these values when transmission constraints cannot be controlled on an extended basis. However, we encourage PJM to work with its

[41] For example, the RTOs/ISOs may be required to adjust flows on a shared flowgate (market-to-market flowgate) or dispatch resources on its system when either entity's flow creates a constraint on a shared flowgate. Both entities utilize the resulting shadow prices that result from coordinated actions to manage the constraint on the flowgate, which could result in an RTO/ISO setting a shadow price produced by the other RTO/ISO on its flowgate. *See* MISO-PJM JOA, Attachment 3, Section 3.1 "Real-Time Energy Market Coordination Procedures." *See also* NYISO-PJM JOA, Schedule D, Section 7 "Real-Time Energy Market Coordination Procedures."

[42] *See* MISO-PJM JOA, Attachment 3, Section 3.1 "When One of the RTOs Does Not Have Sufficient Redispatch"; NYISO-PJM JOA, Schedule D, Section 9 "When One of the RTOs Does Not Have Sufficient Redispatch."

[43] *Id.*

[44] PJM Transmittal at 8.

[45] *Id.* at n.17.

stakeholders to continue to explore areas for improvement in its methodology to calculate default transmission constraint penalty factor values.

The Commission orders:

PJM's proposed Tariff and Operating Agreement revisions are hereby accepted, effective February 1, 2019, as discussed in the body of this order.

By the Commission.

(S E A L)

Kimberly D. Bose,
Secretary.