UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.	)))	Docket No. ER19-323-000
		Docket No. ER18-2401
		Not Consolidated

COMMENTS OF THE INDEPENDENT MARKET MONITOR FOR PJM

Pursuant to Rule 211 of the Commission's Rules and Regulations,[1] Monitoring Analytics, LLC, acting in its capacity as the Independent Market Monitor ("Market Monitor") for PJM Interconnection, L.L.C. ("PJM"),[2] submits these comments supporting the tariff revisions proposed by PJM Interconnection, L.L.C. ("PJM") on November 9, 2018. ("November 9 Filing").[3] PJM notified the Commission that the proposed revisions to the tariff also serve to satisfy the Commission's compliance directive in Order No. 844.[4] PJM's proposed revisions to allow transmission constraint penalty factors to set the marginal value of a violated transmission constraint, rather than applying constraint relaxation logic, would result in Locational Marginal Prices ("LMPs") that accurately reflect the underlying supply and demand conditions that are subjected to the shortage of transmission capacity. PJM's proposed revisions correct a long overdue deficiency in the calculation of LMPs.

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[1]   18 CFR § 385.211 (2018).

[2]   Capitalized terms used herein and not otherwise defined have the meaning used in the PJM Open Access Transmission Tariff ("OATT"), the PJM Operating Agreement ("OA") or the PJM Reliability Assurance Agreement ("RAA").

[3]   See *PJM Interconnection , L.L.C.*, Docket No. ER19-323-000 (November 9, 2018).

[4]   See *PJM Interconnection , L.L.C.*, Docket No. ER18-2401-000 (November 9, 2018).

PJM's proposed changes, however, keep open the possibility of not allowing transmission constraint penalty factors to set prices for violated market to market coordinated transmission constraints under certain circumstances. The Market Monitor believes that PJM should enforce marginal pricing for all constraints, including the market to market coordinated constraints.

The proposed changes to the tariff omit a clearly stated deadline for posting changes to the transmission constraint penalty factors. The Market Monitor believes that a clearly stated deadline is needed to ensure that market participants have access to current and accurate information that affects LMPs.

The PJM proposed revisions should be approved, with the Market Monitor proposed modifications.

I. BACKGROUND

In the day-ahead and real-time markets, PJM uses Security Constrained Economic Dispatch (SCED), a mathematical optimization program, to determine the output level of generators needed to deliver a reliable supply of power at the lowest cost possible. In determining the output levels for generators, the SCED optimization respects transmission line limits, generator ramp limitations and mandated reserve requirements. The locational marginal price (LMP), which represents the marginal cost of serving the next incremental load at the location, are also obtained from the solution of the SCED optimization.

The effectiveness of using the SCED to dispatch generators and to determine marginal prices relies on the accurate representation of all transmission limitations that affect the delivery of power to the load. However, in practice, strict enforcement of transmission line limits is not a feasible operational procedure.[5] All system operators have

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[5]   System operators allow normal or post-contingency flows on transmission facilities in SCED to exceed the rated limits for brief periods of time to find a feasible dispatch solution. System

been using a modified SCED approach where normal and contingency transmission constraints are allowed to be violated.[6] However, every MWh of violation is charged a pre-specified penalty. The penalty, commonly referred as a transmission constraint penalty factor or marginal value limit, is set sufficiently high so as to allow the SCED to exhaust all dispatch opportunities to meet the load before violating the transmission constraint.[7]

PJM's current practice does not allow prices to reflect the underlying transmission penalty factors that were actually used to obtain the dispatch solution. Instead, PJM applies a procedure that PJM termed constraint relaxation logic, under which a revised SCED dispatch solution is obtained with an artificially increased limit for the violated transmission facility. The violation of a transmission constraint despite a sufficiently high transmission constraint penalty factor reflects the shortage of generation needed to relieve the constraint. PJM's application of constraint relaxation logic results in LMPs not reflecting the underlying shortage of transmission capacity. PJM's proposed revisions are a culmination of the Market Monitor's recommendation aimed at addressing this important shortcoming in the calculation of LMPs.[8]

II. COMMENTS

A. PJM's Proposed Revisions Results in Efficient Pricing

PJM's proposed revisions to allow transmission constraint penalty factors to set the marginal value of violated transmission constraints is consistent with efficient pricing principles. Under efficient pricing principles, the marginal value or the shadow price of a

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operators recognize that SCED's failure to find a feasible dispatch solution in real time is highly disruptive.

[6]   See 158 FERC ¶ 61,047 (January 19, 2017) at p 37.

[7]   *Id* at p 38.

[8]   See *2015 State of the Market Report for PJM*, Vol. 2 Section 3: Energy Market, Recommendations.

transmission constraint represents the incremental value of the transmission capacity for facilitating the reliable delivery of electric power to the load.

If the flow on the transmission constraint is below its operating limit, increasing the constraint limit would not have any effect on the overall cost of generation dispatched to meet the load. In these instances, the shadow price of the transmission constraint should be zero.

If the flow on the transmission constraint is equal to its operating limit, increasing the constraint limit would allow cheaper generation to displace expensive generation resulting in reducing the overall cost of generation dispatched to meet the load. The shadow price of the transmission constraint should be equal to the incremental value of the redispatch.[9]

If the flow on the transmission constraint is higher than its operating limit, increasing the constraint limit would reduce the incurred violation penalty. The shadow price of the transmission constraint should be equal to the specified transmission constraint penalty factor.

PJM's current approach correctly calculates the shadow price of a transmission constraint when the flow on the transmission constraint is below its operating limit or equal to its operating limit. When the flow on the transmission constraint exceeds its operating limit, PJM's application of constraint relaxation logic prevents the shadow price from being equal to the specified transmission constraint penalty factor. PJM's proposal to allow the shadow price of the violated transmission constraint to be equal to its transmission constraint penalty factor would result in efficient prices.

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[9]   If the flow on the transmission constraint is equal to the constraint limit, the shadow price is a linear function of marginal generator offer prices.

B. PJM Should Specify a Deadline for Posting of Changes to Default Penalty Factors

The Commission through Order No. 844 required all ISOs to post changes to default transmission constraint penalty factors in a timely manner.[10] The Commission reasoned that the level of transmission constraint penalty factors are important for market participants to be able to hedge transactions and raise concerns related to the ISO practices through the stakeholder practices.[11]

The Commission states at 85:

> … [W]e also require that any procedures for temporarily changing transmission penalty factor values must provide for notice of change to market participants as soon as predictable.

PJM proposed to add the following language to the tariff in compliance with Order No. 844.[12]

PJM (at 16):

> The Office of the Interconnection shall post, as soon as practicable, on its website any changes to the default Transmission Constraint Penalty Factor values used in the Real-Time Energy Market and/or the Day-Ahead Energy Market.

However, PJM declined to specify a deadline for posting of changes to transmission constraint penalty factors in its proposed revision to the tariff. PJM argued that such self-imposed deadline would deprive PJM of sufficient flexibility in the event of any unforeseen circumstances. The Market Monitor believes that clearly specified deadlines for posting of

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[10]   See 163 FERC ¶ 61,041 (April 19, 2018) at p 37.

[11]   18 CFR § 35 (2018) at 77.

[12]   November 9 Filing at 16

changes to transmission penalty factors provides greater transparency and predictability to the market participants.

The tariff specifies clear deadlines for posting of LMPs, and for reposting of LMPs in the event PJM discovers an error in prices or cleared quantities.[13] PJM did not provide any adequate reason that warrants a different treatment for transmission penalty factors. The Market Monitor believes that data on changes to transmission penalty factors should be treated as any other market price formation data and should have similar disclosure requirements.

C. PJM Should Not Use Constraint Relaxation Logic for Any Constraints, Including Market-to-Market Constraints

PJM's proposed changes to the tariff keep open the possibility of applying constraint relaxation logic to market to market coordinated constraints. PJM proposed to add the following paragraph to its tariff.

PJM (at 8):

> If the Real-time Energy Market constraints are subject to market-to-market congestion management protocols with an adjacent Regional Transmission Organization and the market clearing software cannot produce a solution that manages the flow on a constraint within the binding limit in a dispatch interval, the Office of the Interconnection may coordinate with such Regional Transmission Organization to either allow the Transmission Constraint Penalty Factor to set the Marginal Value of the transmission constraint or to apply the Constraint Relaxation Logic upon mutual agreement in accordance with applicable Joint Operating Agreements.

PJM argued that the language would provide operational flexibility "to accommodate potential requests from an adjacent Regional Transmission Organization

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[13]   OATT Attachment K (Transmission Congestion and Loss Charges and Credits) § 1.10.8 (e).

(RTO) that requires a transmission limit to be adjusted and apply Constraint Relaxation Logic."

The application of constraint relaxation logic for any constraints, including coordinated market to market constraints is a deviation from efficient pricing principles. PJM should not be forced to accommodate the inefficient practices of a neighboring RTO that undermine market pricing principles.

D. PJM Should Continue Its Efforts to Define the appropriate level for Transmission Penalty Factors

PJM's proposed changes to the tariff address an important deficiency in the calculation of LMPs in the short term. The Market Monitor recommends that PJM continue its efforts to adequately value the cost of violating a transmission constraint. PJM states that $2,000 per MWh for the Real-Time Energy Market and $30,000 per MWh for Day-Ahead Energy Market is adequate based on historical experience.[14] PJM needs to develop a method to determine the value of relieving a localized shortage situation based on other relevant constraints in the PJM markets. Since the SCED simultaneously evaluates all available tradeoffs between the local shortage of transmission capacity and the broader reserve requirements, any value chosen for the default transmission penalty factor should also be consistent with the RTO wide reserve penalty factors.

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[14]   November 9 Filing at pp 8-9.

III. CONCLUSION

The Market Monitor respectfully requests that the Commission afford due consideration to these comments as it resolves the issues raised in this proceeding.

Respectfully submitted,

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Dated: November 27, 2018

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CERTIFICATE OF SERVICE

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

Dated at Eagleville, Pennsylvania,
this 27th day of November.

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