

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

PJM Interconnection, L.L.C.)
) Docket No. ER17-775-001
)

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 for PJM² (“Market Monitor”), submits these comments in response to the filing submitted by PJM Interconnection, L.L.C. (“PJM”) on March 27, 2017, (“March 27 Filing”), in compliance with Order No. 825, and in response to the Commission’s deficiency letter issued in this proceeding on February 23, 2017 (“Deficiency Letter”).³

I. COMMENTS

A. The March 27 Filing Clarifies the Settlement Interval Applicable to Energy Withdrawals by Generation Resources.

In the Deficiency Letter, the Commission requested clarification regarding the settlement interval applicable to energy withdrawals by generation resources. The March 27 Filing provides an explanation and tariff language clarifying that PJM will settle energy

¹ 18 CFR § 385.211 (2016).

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 *Settlement Intervals and Shortage Pricing in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Order No. 824, 155 FERC ¶ 61,276 (2016) (“Order No. 825”).

withdrawals by a generation resource on a five minute basis for resources with five minute metering. The revised Section 3.1A clarifies the settlement interval that applies to withdrawals by generators.

B. Demand Response Must Comply with Settlement Interval Reform.

As noted in the Deficiency Letter (at 4), Order No. 825 requires settlement interval reform for all resources, including demand response. PJM's compliance filing does not provide compliant tariff revisions to ensure that it would settle demand response resources with five minute metering capability on a five minute basis. The fact that no demand response resource currently submits five minute metering data does not exempt PJM from compliance.⁴ If a demand response resource has five minute metering capability, the tariff language should clarify that PJM will require such resource to provide the five minute data and will settle that resource on a five minute interval basis. PJM's proposed Section 3.1A(f) would prevent demand response resources with five minute metering capability from being settled on an five minute basis, because it would have demand response resources submit only hourly data even when resources have five minute metering capability. Order No. 825 correctly requires the same treatment of demand response resources as generation resources. PJM should be required to provide compliant tariff revisions.

C. Consistent Division by 12 Is Needed for Accuracy and Clarity.

In its February 1, 2017, comments, the Market Monitor pointed out that consistent division by 12 in the OATT is needed for precision and clarity of settlements. In general, the correct specification of settlements in the OATT would be more precise and much clearer if it employed mathematical expressions. The Market Monitor has identified several incorrect settlement calculations in the OATT that need to be corrected.

⁴ March 27 Filing at 9.

The Deficiency Letter specifically addressed the calculation of operating reserve deviation charges in Operating Agreement Section 3.2.3(h). In response, PJM added clarity to the calculation in Section 3.2.3 (h) regarding the units of measurement, division by 12, and summation over intervals and hours. Section 3.2.3 (h) would be much clearer and would be precise if it employed more mathematical expressions which can define calculations unambiguously. The operating reserve deviation charge calculation was particularly confusing as originally filed. It is not the only section of the OATT containing settlements expressions that are in need of edits.

For example, the calculation of Operating Reserve credits for lost opportunity costs in Section 3.2.3 (f-1) (ii) combines hourly day-ahead data with five minute real-time data in a calculation *for each Real-time Settlement Interval* but fails to divide by 12. The calculation is the product of A, the day-ahead cleared MWh for the unit, and B, the real-time LMP in dollars per MWh, minus C, the applicable offer for energy measured in dollars per hour:

$$LOC = DA\ MWh * RT\ LMP - Offer$$

Where:

LOC is the lost opportunity cost in dollars,

DA MWh is the day-ahead cleared unit output for the hour in MWh,

RT LMP is the real-time locational marginal price for the five minute interval in dollars per MWh, and

Offer is the area under the energy offer curve, in dollars per hour, plus no load costs, in dollars per hour, plus any applicable start costs apportioned over the units minimum run time, measured in dollars per hour.⁵

The result of the calculation is intended to be a value for each five minute interval. The calculation incorrectly produces a result in dollars per hour. The calculation should be made separately for each five minute Real-time Settlement Interval. The DA MWh and the

⁵ See March 27 Filing, Marked Tariff Changes, OATT 3.2.3(f).

offer must be divided by 12, the number of five minute intervals in the hour, to correctly calculate the credit. For final settlement purposes, each five minute calculation can be summed to calculate an hourly, or daily, credit. Mathematically, the correct calculation is:

$$LOC = \sum_i \left(\frac{DA\ MWh_{h,i}}{12} * RT\ LMP_i - \frac{Offer_{h,i}}{12} \right)$$

Where:

i indexes five minute Real-time Settlement Intervals,
h indexes the hour containing interval *i*, and
LOC, *DA MWh*, *RT LMP*, and *Offer* are defined above.

Similar misspecifications of settlements occur in:

Regulation: 3.2.2 (e);

Operating Reserves: 3.2.3 (f) and 3.2.3 (f-4);

Synchronized Reserves: 3.2.3A (f);

Nonsynchronized Reserves: 3.2.3A.001 (e);

Day-Ahead Scheduling Reserves: 3.2.3A.01 (c) and 3.2.3A.01 (d);

Reactive Services: 3.2.3B (c), 3.2.3B (d) and 3.2.3B (f); and

Charges for Nonperformance: Attachment DD, Section 10A(c) to (g).

Lack of precision can lead to inconsistency in application and unintended settlements. In addition, lack of precision may result in vulnerability to market manipulation. The Market Monitor has not made a comprehensive listing of all mathematical errors in PJM's compliance filing. The Order 825 Compliance proceeding presents an opportunity for the Commission to require PJM to perform a thorough review of all associated settlements specifications in the tariff to ensure precision, accuracy and clarity. It is needed.

II. 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: April 14, 2017

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 14th day of April, 2017.



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