



Monitoring  
Analytics

**Activities of the  
Market Monitoring Unit  
2017**

Independent Market Monitor for PJM  
October 16, 2018

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## Preface

This report is posted pursuant to Section VI.C of Attachment M to the PJM Open Access Transmission Tariff (the “PJM Market Monitoring Plan” or “Plan”), which directs the Market Monitoring Unit (“Market Monitor,” also known as the “MMU,” Independent Market Monitor for PJM” or “IMM”) “to prepare a detailed public annual report about the Market Monitoring Unit’s activities, subject to protection of confidential, proprietary, and commercially sensitive information and the protection of the confidentiality of ongoing investigations and monitoring activities.”<sup>1</sup>

Monitoring Analytics, LLC serves as the Independent Market Monitor for PJM.<sup>2</sup> PJM is a regional transmission organization (RTO) that is responsible for ensuring the reliability of the electric power supply system in 13 states and the District of Columbia. The MMU is responsible for promoting a robust, competitive and nondiscriminatory electric power market in PJM by implementing the PJM Market Monitoring Plan.

The Federal Energy Regulatory Commission (FERC) assigns three core functions to MMUs: reporting, monitoring and market design.<sup>3</sup> These functions are interrelated and overlap. The PJM Market Monitoring Plan establishes these functions, providing that the MMU is responsible for monitoring: compliance with the PJM Market Rules; actual or potential design flaws in the PJM Market Rules; structural problems in the PJM markets that may inhibit a robust and competitive market; the actual or potential exercise of market power or violation of the market rules by a market participant; PJM’s implementation of the PJM Market Rules or operation of the PJM markets; and such matters as are necessary to prepare reports.<sup>4</sup>

The MMU performs its reporting function primarily by issuing and filing annual and quarterly state of the market reports, and reports on market issues. The MMU also issues in depth reports on specific topics. The MMU regularly issues reports on RPM auctions. In other reports, the MMU responds to the needs of FERC, state regulators, or other regulatory authorities, in order to assist policy development, decision making in regulatory proceedings, and in support of investigations. The MMU also participates in FERC technical conferences as appropriate.

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<sup>1</sup> PJM Open Access Transmission Tariff (OATT) Attachment M § VI.C.

<sup>2</sup> See 144 FERC ¶ 61,238 (2013).

<sup>3</sup> 18 CFR § 35.28(g)(3)(ii); see also *Wholesale Competition in Regions with Organized Electric Markets*, Order No. 719, FERC Stats. & Regs. ¶31,281 (2008) (“Order No. 719”), *order on reh’g*, Order No. 719-A, FERC Stats. & Regs. ¶31,292 (2009), *reh’g denied*, Order No. 719-B, 129 FERC ¶ 61,252 (2009).

<sup>4</sup> OATT Attachment M § IV; 18 CFR § 1c.2.

To perform its monitoring function, the MMU screens and monitors the conduct of market participants under the MMU's broad purview to monitor, investigate, evaluate and report on the PJM markets.<sup>5</sup> The MMU has direct, confidential access to the FERC.<sup>6</sup> The MMU may also refer matters to the attention of state commissions.<sup>7</sup>

The MMU monitors market behavior for violations of FERC Market Rules.<sup>8</sup> The MMU will investigate and refer "Market Violations," which refers to any "tariff violation, violation of a Commission-approved order, rule or regulation, market manipulation, or inappropriate dispatch that creates substantial concerns regarding unnecessary market inefficiencies..."<sup>9</sup> <sup>10</sup> The MMU also monitors PJM for compliance with the rules, in addition to market participants.<sup>11</sup>

Another important component of the monitoring function is the review of inputs to mitigation. The actual or potential exercise of market power is addressed in part through *ex ante* mitigation rules incorporated in PJM's market clearing software for the energy market, the capacity market and the regulation market. If a market participant fails the TPS test in any of these markets its offer is set to the lower of its price-based or cost-based offer. This prevents the exercise of market power and ensures competitive pricing, provided that the cost-based offer accurately reflects short run marginal costs. Cost-

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<sup>5</sup> OATT Attachment M § IV.

<sup>6</sup> OATT Attachment M § IV.K.3.

<sup>7</sup> OATT Attachment M § IV.H.

<sup>8</sup> OATT Attachment M § II(d)&(q) ("FERC Market Rules" mean the market behavior rules and the prohibition against electric energy market manipulation codified by the Commission in its Rules and Regulations at 18 CFR §§ 1c.2 and 35.37; the Commission-approved PJM Market Rules and any related proscriptions or any successor rules that the Commission from time to time may issue, approve or otherwise establish... "PJM Market Rules" mean the rules, standards, procedures, and practices of the PJM Markets set forth in the PJM Tariff, the PJM Operating Agreement, the PJM Reliability Assurance Agreement, the PJM Consolidated Transmission Owners Agreement, the PJM Manuals, the PJM Regional Practices Document, the PJM-Midwest Independent Transmission System Operator Joint Operating Agreement or any other document setting forth market rules.")

<sup>9</sup> The FERC defines manipulation as engaging "in any act, practice, or course of business that operates or would operate as a fraud or deceit upon any entity." 18 CFR § 1c.2(a)(3). Manipulation may involve behavior that is consistent with the letter of the rules, but violates their spirit. An example is market behavior that is economically meaningless, such as equal and opposite transactions, which may entitle the transacting party to a benefit associated with volume. Unlike market power or rule violations, manipulation must be intentional. The MMU must build its case, including an inference of intent, on the basis of market data.

<sup>10</sup> OATT Attachment M § II(h-1).

<sup>11</sup> OATT Attachment M § IV.C.

based offers for the energy market and the regulation market are based on short run marginal costs, also referred to as incremental costs.<sup>12</sup> The MMU reviews units' fuel cost policies to ensure that they define, in an algorithmic, verifiable and systematic way, how the market value of fuel is calculated in cost-based offers.

In order to perform its role in PJM market design, the MMU evaluates existing and proposed PJM Market Rules as well as the design of the PJM markets.<sup>13</sup> The MMU initiates and proposes changes to the design of such markets or the PJM Market Rules in stakeholder or regulatory proceedings.<sup>14</sup> In support of this function, the MMU engages in discussions with stakeholders, State Commissions, PJM Management, and the PJM Board; participates in PJM stakeholder meetings or working groups regarding market design matters; publishes proposals, reports or studies on such market design issues; and makes filings with the Commission on market design issues.<sup>15</sup> The MMU also recommends changes to the PJM Market Rules to the staff of the Commission's Office of Energy Market Regulation, State Commissions, and the PJM Board.<sup>16</sup> The MMU may provide in its annual, quarterly and other reports "recommendations regarding any matter within its purview."<sup>17</sup>

The MMU posts market data, public reports, presentations and market messages on the Monitoring Analytics web page at: <http://www.monitoringanalytics.com>.

## **Monitoring**

### ***Market Surveillance***

The MMU analyzes and monitors all of the PJM markets, including the Day-Ahead Energy Market, the Real-Time Energy Market, the RPM Base Residual Auctions and Incremental Auctions, the Regulation Market, the Synchronized Reserve Market, the Day-Ahead Scheduling Reserve Market and the Annual, Monthly, Long Term and Balance of Planning Period Auction Markets in Financial Transmission Rights (FTRs). This ongoing market analysis and monitoring forms the basis for all MMU activities.

If the MMU determines that it has sufficient credible information that a participant's market behavior requires investigation it will submit a formal confidential referral of such behavior to the FERC Office of Enforcement.<sup>18</sup> Such referrals typically include

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<sup>12</sup> See OATT Attachment M–Appendix § II.A.

<sup>13</sup> OATT Attachment M § IV.D.

<sup>14</sup> *Id.*

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> OATT Attachment M § VI.A.

<sup>18</sup> OATT Attachment M § IV.I.

substantial analysis of the issue referred. After a referral, the MMU provides further assistance to FERC staff at their request.

The MMU monitors participant development of inputs to prospective mitigation, including Avoidable Cost Rates and net revenues in RPM; unit-specific offers in the capacity market under the Minimum Offer Price Rule; offer caps for Capacity Performance resources, including unit specific offer caps and risk premia; fuel costs, cost-based offers and operating parameters in the energy markets, including eligibility for Frequently Mitigated Unit (FMU) adders. In the course of this monitoring, the MMU provides feedback to participants and engages in discussions about the appropriateness of costs and cost levels. The MMU applies the FTR forfeiture rule, a retroactive mitigation measure, the results of which are reviewed by PJM prior to billing PJM members. The MMU monitors compliance with the RPM and CP must offer rules and reviews exception requests to these rules. The MMU monitors compliance with the Minimum Offer Price Rule (MOPR) and reviews Competitive Entry Exemption and Self Supply Exemption requests. The MMU monitors compliance with the must offer rule for capacity resources in the Day-Ahead Energy Market. The MMU monitors costs included in black start service rates. The MMU reviews proposed deactivations to identify potential market power issues. The MMU prepares monthly notifications to PJM generation owners regarding the status of Frequently Mitigated Units per Schedule 1, Section 6.4.2 of the PJM Operating Agreement.

### ***Market Participant Discussions***

The PJM Market Monitoring Plan provides that in addition to informing Commission staff, the MMU may “Engage in discussions regarding issues relating to the PJM Market Rules or FERC Market Rules in order to understand such issues and to attempt to resolve informally such issues or other issues.”<sup>19</sup> In fulfilling this role in 2017, the MMU monitored participant behavior and discussed relevant matters with FERC staff and with market participants. In addition, the MMU received and investigated confidential complaints. The provision of additional details on these issues is governed by confidentiality rules.

The MMU engaged in extensive discussions with generating unit owners about their fuel cost policies, cost-based offers, and requirements for compliance with Market Rules.

In 2017, the MMU received confidential complaints and when appropriate, publicly proposed rule modifications while maintaining market participant confidentiality. A confidential complaint can reveal flaws in existing rules or procedures.

In addition to discussing notices and/or referrals on a confidential basis regarding the activities in the markets in 2017, the MMU engaged in numerous discussions with market participants about issues related to participant behavior in the PJM markets.

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<sup>19</sup> OATT Attachment M, § IV.J.1.

The MMU was involved, along with PJM staff, in reviewing the generator parameter adjustment requests for Capacity Performance Resources, and in discussing the technical issues raised by generation owners for the adjustment requests. The MMU provided its input on PJM's criteria for determining the parameter limits for Capacity Performance resources, as well as areas of agreement and disagreement.

The MMU held discussions with PJM regarding compensation for compliance with the new NERC standard BAL-003-01, frequency response.

The MMU engaged in discussions with generators, demand side providers, storage providers, renewable energy suppliers, financial participants, industrial customers, public power entities, state public utility commissions and consumer advocates.

### ***Communications with Regulators***

The MMU provides information to regulators, subject to compliance with applicable rules protecting confidentiality. In 2017, the MMU:

- Filed referrals as appropriate.
- Intervened in 45 reactive rate case filings at FERC.
- Communicated with FERC staff regarding a range of issues.
- Provided data in response to requests from FERC staff.
- Attended meetings and conference calls with state regulators, the Organization of PJM States, Inc. (OPSI), and state consumer advocates to answer questions and discuss a range of topics related to PJM markets.

### **Reporting<sup>20</sup>**

#### ***Reports and Analyses***

The state of the market reports fulfilled the reporting requirements in the tariff and Commission regulations on market monitoring policy by providing a comprehensive analysis of the markets within PJM and an assessment of the competitiveness of each market.<sup>21</sup> The reports also provided recommendations regarding retention and enhancement of market rules.

- The 2016 State of the Market Report for PJM (March 9, 2017).
- The 2017 Quarterly State of the Market Report for PJM: January through March (May 11, 2017).
- The 2017 Quarterly State of the Market Report for PJM: January through June (August 10, 2017).

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<sup>20</sup> Public reports by the MMU are posted at <<http://www.monitoringanalytics.com>>.

<sup>21</sup> OATT Attachment M § VII.A; 18 CFR § 35.28(g)(3)(ii)(B).

- The 2017 Quarterly State of the Market Report for PJM: January through September (November 9, 2017).

The MMU issued additional reports in 2017:

- Summary of BRA Analysis Results: 2013/2014 - 2019/2020 (January 24, 2017)
- Activities of the Market Monitoring Unit: 2016 (July 25, 2017).
- Analysis of the 2020/2021 RPM Base Residual Auction (November 17, 2017).
- Analysis of Replacement Capacity for RPM Commitments: June 1, 2007 to June 1, 2017 (December 14, 2017).

The MMU issued Market Messages in 2017:

- Pipeline Enforced Ratable Takes and Energy Offers (January 18, 2017).
- IMM Notification to PJM Members of Disclosure of Confidential Information Pursuant to OATT Attachment M - Appendix I.D (February 1, 2017).
- Generation Capacity Resources in PJM Region Subject to RPM Must Offer Obligation for 2017/2018, 2018/2019 and 2019/2020 Delivery Years (February 24, 2017).
- IMM Notification to PJM Members of Disclosure of Confidential Information Pursuant to OATT Attachment M - Appendix I (March 2, 2017).
- Press Release - 2016 State of the Market Report for PJM (March 9, 2017).
- Members Committee Letter – 2016 State of the Market Report for PJM (March 9, 2017).
- Submitted Fuel Cost Policies (March 30, 2017).
- Generation Capacity Resources in PJM Region Subject to RPM Must Offer Obligation for 2018/2019, 2019/2020 and 2020/2021 Delivery Years (May 9, 2017).
- Press Release - 2017 Quarterly State of the Market Report for PJM: January through March (May 11, 2017).
- Members Committee Letter – 2017 Quarterly State of the Market Report for PJM: January through March (May 11, 2017).
- MIRA Cost Offer Assumptions Module (May 26, 2017).
- Generation Capacity Resources in PJM Region Subject to RPM Must Offer Obligation for 2018/2019, 2019/2020 and 2020/2021 Delivery Years (July 7, 2017).
- Market Monitor’s Evaluation of Passed and Failed Fuel Cost Policies (July 7, 2017).
- Press Release - 2017 Quarterly State of the Market Report for PJM: January through June (August 10, 2017).
- Members Committee Letter – 2017 Quarterly State of the Market Report for PJM: January through June (August 10, 2017).
- Generation Capacity Resources in PJM Region Subject to RPM Must Offer Obligation for 2018/2019, 2019/2020 and 2020/2021 Delivery Years (September 9, 2017).
- Press Release - 2017 Quarterly State of the Market Report for PJM: January through September (November 9, 2017).



- Members Committee Letter – 2017 Quarterly State of the Market Report for PJM: January through September (November 9, 2017).
- IMM Parameter Limited Schedule Matrix (Annual) (December 22, 2017).
- Generation Capacity Resources in PJM Region Subject to RPM Must Offer Obligation for 2018/2019, 2019/2020 and 2020/2021 Delivery Years (December 27, 2017).

The MMU issued a state report in 2017:

- State Congestion Report – DOM NC: 2016 (July 14, 2017).

## ***Industry Briefings***

As part of its reporting role, the MMU provided briefings and presentations to industry groups and the Federal Energy Regulatory Commission (FERC). In 2017, the MMU shared the results of its analyses, experience and knowledge regarding competitive markets, market monitoring and market power mitigation at various conferences and meetings.

- Participant. OPSI Spring Meeting, Louisville, KY (April 3, 2017).
- Speaker. Price Formation Issues in Wholesale Energy Markets, EUCI Baltimore, MD (April 10-11, 2017).
- Speaker. EPSA, Chicago, IL (April 18, 2017).
- Speaker. PJM Grid 20/20, Philadelphia, PA (April 19, 2017).
- Speaker. WSPP, Austin, TX (April 20, 2017).
- Speaker. Skadden 12<sup>th</sup> Annual Enforcement and Compliance Conference, Washington, D.C. (May 3, 2017).
- Speaker. PJM Annual Meeting of Members, Chicago, IL (May 15 – 17, 2017).
- Speaker. PJM Annual Meeting of Members, Chicago, IL (May 15 – 17, 2017).
- Speaker. National Regulatory Conference, Williamsburg, VA (May 18-19, 2017).
- Speaker. Harvard Electric Policy Review, Cambridge, MA (June 1 – 2, 2017).
- Speaker: Kleinman Center for Energy Policy, Philadelphia, PA (May 4, 2017).
- Speaker. Governor’s Committee on Energy Choice, Las Vegas, NV (September 13, 2017).
- Speaker. Raab Associates Roundtable, Philadelphia, PA (September 27, 2017).
- Speaker. OPSI Annual Meeting, Arlington, VA (October 2-4, 2017).
- Speaker. Harvard Kennedy Business School Weekly Energy Policy Seminar. Cambridge, MA (October 16, 2017).
- Speaker. RTO Policy Session, ICC. Chicago, IL. (October 19, 2017).
- Speaker. MidAtlantic Power Summit, Philadelphia, PA (October 24-25, 2017).
- Speaker. Platts 10<sup>th</sup> Annual Nodal Trader, New York, New York (October 26-27, 2017).

- Speaker. Pennsylvania Energy Management Conference, Harrisburg, PA (November 8, 2017).
- Speaker. Raab Associates Roundtable. Philadelphia, PA (November 28, 2017).
- Speaker. Electricity Consumers Resource Council. Washington, DC. (December 12, 2017).

## **Market Design**

Attachment M, Section IV.D provides “if the Market Monitoring Unit detects a design flaw or other problem with the PJM Markets, the Market Monitoring Unit may initiate and propose, through the appropriate stakeholder processes, changes to the design of such market. In support of this function, the Market Monitoring Unit may engage in discussions with stakeholders, State Commissions, PJM Management, or the PJM Board; participate in PJM stakeholder meetings or working groups regarding market design matters; publish proposals, reports or studies on such market design issues; and make filings with the Commission on market design issues.”<sup>22</sup> In FERC Order No. 719 and its order on compliance for PJM, the Commission has emphasized this MMU core function.<sup>23</sup>

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<sup>22</sup> OATT Attachment M § IV.D.

<sup>23</sup> See Order No. 719 at P 357 (“[W]e do expect the MMU to advise the Commission, the RTO or ISO, and other interested entities of its views regarding any needed rule and tariff changes. Likewise, in the event an RTO or ISO files for a proposed tariff change with which the MMU disagrees, we expect the RTO or ISO to inform the Commission of that disagreement, although not necessarily to include a written proposal with its filing.”), codified at 18 C.F.R. § 35.28 (g)(3)(ii)(A) (“The Market Monitoring Unit must perform the following core functions: (A) Evaluate existing and proposed market rules, tariff provisions and market design elements and recommend proposed rule and tariff changes to the Commission-Approved independent system operator or regional transmission organizations, to the Commission’s Office of Energy Market Regulation staff and to other interested entities such as state commissions and market participants”). In its order of December 18, 2009, on PJM’s filing in compliance with Order No. 719, the Commission required additional changes to ensure that the PJM Market Monitoring Plan fully conforms to Order No. 719’s requirements concerning the role of MMUs in market design. 125 FERC ¶61,250 at P 113 (2009) (“PJM’s OATT fails to specify the MMU’s responsibility for evaluating existing and proposed market rules, tariff provisions and market design elements, and for recommending proposed rule and tariff changes to PJM, the Commission’s Office of Energy Market Regulation and to other interested entities (i.e., state commissions and market participants). Attachment M, section IV.C, in this regard, provides only that, if the MMU “detects a design flaw or other problem with the PJM Markets,” it may initiate and propose changes to such market design. This language, however, is limited to “design” issues relating to existing provisions and thus does not address the full scope of the core MMU function addressed by the Commission in Order No. 719”).

On October 17, 2017, PJM filed an MMU/PJM joint proposal to correct a number of identified flaws with PJM's Regulation Market with FERC. PJM's regulation market design is severely flawed and does not follow the appropriate basic design logic. Due to these flaws, the market results do not represent the least cost solution for the defined level of regulation service.

In 2017, the MMU recommended changes to the long term financial transmission rights (LTFTR) markets to limit the product to year one only, to reserve a greater proportion of congestion rights for auction revenue rights holders (ARR), increase the value of congestion rights relative to expected congestion, and better align the set of rights made available at auction with expected system capability.

In 2017, the MMU recommended that PJM implement mitigation for aggregate market power in the energy market. The MMU included its recommendation in the State of the Market report and presented its findings to the Market Monitoring Unit Advisory Committee.

In 2017, the MMU continued to recommend that PJM clarify that cost-based offers should be equal to short run marginal costs. The only reason for cost-based offers is to prevent the exercise of market power. The competitive offer level is equal to short run marginal cost.

In 2017, the MMU introduced its MOPR-Ex proposal and engaged in stakeholder discussions in the Capacity Construct/Public Policy Senior Task Force (CCPPSTF) to address impacts of potential state public policy changes on RPM outcomes.

In 2017, the MMU engaged in discussions with PJM and stakeholders in the Incremental Auction Senior Task Force (IASTF) concerning the RPM Incremental Auction process and replacement capacity rules. The MMU presented an updated report on replacement activity and proposed rule changes to deter speculative behavior in the capacity market.

In 2015, the MMU pointed out that PJM's policy governing the use of transmission penalty factors in the day-ahead and real-time market clearing was inadequate. The MMU recommended that PJM explicitly state its policy on the use of transmission penalty factors including: the level of the penalty factors; the triggers for the use of the penalty factors; the appropriate line ratings to trigger the use of penalty factors; and the allowed duration of the violation. The MMU continued to work with PJM to develop market rules aimed at aligning penalty factors with broader scarcity pricing parameters and to incorporate consistent and transparent application across all transmission constraints and market conditions.

In 2014 and 2015, the MMU recognized that Fuel Cost Policies as currently implemented did not provide adequate information for verifying cost based offers, especially on days with high natural gas prices. The MMU recommended that all fuel cost policies include an algorithmic, systematic, and verifiable description of the calculation of the market cost of fuel for each unit and that PJM only accept energy offers exceeding \$1,000 per MWh if they were based on short run marginal costs. In 2017, PJM incorporated a

number of the MMU's recommendations in the new Fuel Cost Policy approval process and cost-based offer verification process.<sup>24</sup> The MMU continues to recommend a higher standard for fuel cost policies and cost-based offers than PJM's current standard.

## ***FERC Proceedings***

In 2017, the MMU intervened in the proceedings at the FERC, filed substantive pleadings, most of which addressed market design issues and participated in numerous settlement and technical conferences with FERC staff in an effort to achieve compensation for reactive capability that is consistent with the PJM market design.

- **Offer Caps in Markets (Docket No. RM16-5-000).** Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (January 4).
- **FTR Compliance Filing (Docket No. EL16-6-003).** Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (January 9). IMM Letter (January 27).
- **Talen Reactive Settlement (Docket No. ER16-1456-000).** Motion for Extension of the Independent Market Monitor for PJM (January 10). Notice of Conditional Objection of the Independent Market Monitor for PJM (March 21).
- **Calpine MOPR Complaint (Docket No. EL16-49).** Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (January 30).
- **Order 825 Compliance (Docket No. ER17-775-000, -001).** Comments of the Independent Market Monitor for PJM (February 1). Comments of the Independent Market Monitor for PJM (April 14). Comments of the Independent Market Monitor for PJM (September 5).
- **AMP Complaint re Congestion and Pseudo-Ties (EL17-31).** Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (February 9).
- **Base Capacity Complaint (Docket No. EL17-32 and EL17-36).** Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (February 13).
- **Storage NOPR (Docket Nos. RM16-23 and AD16-20).** Comments of the Independent Market Monitor for PJM (February 21).
- **Fast-Start Pricing (Docket No. RM17-3).** Comments of the Independent Market Monitor for PJM (February 28). Reply Comments of the Independent Market Monitor for PJM (March 15).
- **Hourly Offer Flexibility (Docket No. ER16-372).** Answer of the Independent Market Monitor for PJM (March 10). Comments of the Independent Market Monitor for PJM (March 27). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (April 26). Comments of the Independent Market Monitor for PJM ER16-372-005 (August 11).

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<sup>24</sup> See *PJM Interconnection, L.L.C.*, 158 FERC ¶ 61,133 (2017) and *PJM Interconnection, L.L.C.*, 161 FERC ¶ 61,153 (2017).

- **TranSource (Docket No. EL15-79-001).** Notice (March 29).
- **Pseudo Tie Reform (Docket No. ER17-1138).** Comments of the Independent Market Monitor for PJM (March 30). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (April 17).
- **Uplift NOPR (Docket No. RM17-2).** Comments of the Independent Market Monitor for PJM (April 10).
- **FTRs (Docket No. ER17-1433 and EL14-37-001).** Comments of the Independent Market Monitor for PJM (May 15). Answer and Motion for Leave to Answer (May 31). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (July 10).
- **ESA RESA (Docket No. EL17-64 and EL17-65).** Comments of the Independent Market Monitor for PJM (May 24). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (June 9).
- **Pleasants Transfer (Docket No. EC17-88).** Comments of the Independent Market Monitor for PJM (May 26). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (July 13). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (September 12).
- **Order 831 Compliance (Docket No. ER17-1567).** Comments of the Independent Market Monitor for PJM (May 30). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (June 27).
- **Pseudo Ties (Docket No. EL17-62).** Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (June 7).
- **Dominion Reactive (Docket No. ER06-554 and EL16-89).** Opposition to Settlement (June 14).
- **IMM Complaint re MOPR (Docket No. EL17-82).** Complaint and Request for Fast Track Treatment of the Independent Market Monitor for PJM (July 21). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (August 30)).
- **Pseudo Ties (Docket No. ER17-2218 and ER17-2220).** Comments of the Independent Market Monitor for PJM (August 22). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (September 8).
- **Pseudo Ties (Docket No. ER17-2291).** Comments of the Independent Market Monitor for PJM (September 1). Answer of the Independent Market Monitor for PJM (October 12).
- **IMM Complaint re AEP Cost-Based Offers (Docket No. EL17-22).** IMM Letter Response (September 29). Answer of the Independent Market Monitor for PJM (November 6). IMM Letter with Protective Order (December 5).
- **DOE NOPR (Docket No. RM18-1).** Comment of the Independent Market Monitor for PJM (October 23). Reply Comments of the Independent Market Monitor for PJM (November 7).

- **Hudson-PSEG ISA Dispute (Docket No. EL17-84 and EL17-90).** Comments of the Independent Market Monitor for PJM (November 1). Answer and Motion for Leave to Answer and Motion to Lodge of the Independent Market Monitor for PJM (November 10). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (November 29).
- **Virtual Scheduling Points (Docket No. ER18-88).** Comments of the Independent Market Monitor for PJM (November 7). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (November 27).
- **Uplift Allocation (Docket No. ER18-86).** Comments of the Independent Market Monitor for PJM (November 7). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (November 22).
- **Regulation Market Reform (Docket No. ER18-87).** Comments of the Independent Market Monitor for PJM (November 7). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (November 30). Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (December 20).
- **MOPR Reforms (Docket No. ER13-535).** Answer and Motion for Leave to Answer of the Independent Market Monitor for PJM (November 14).

### ***Technical Conferences***

- **State Policies and Wholesale Markets Operated by ISO New England Inc., New York Independent System Operator, Inc., and PJM Interconnection, L.L.C (Docket No.AD17-11)** IMM Testimony. Panel 2: Stakeholders' Perspective in PJM (May 1-2). Post Technical Conference Comments (June 22).
- **Developments in Natural Gas Index Liquidity and Transparency, (Docket Nos. AD17-12, PL03-3 and AD03-7)** IMM Testimony. Panel 3: Options to Increase Transparency and Liquidity of Natural Gas Indices (June 29). Post Technical Conference Comments of the Independent Market Monitor for PJM (August 1).

### ***Settlement Proceedings***

- **RMR Cape May (Docket No. ER17-1083).** R.C. Cape May (RCCM) agreed to provide reliability must run (RMR) service from its BL England Generating Station while PJM completes system upgrades that would allow the plant to retire. RCCM filed a Reliability Must Run (RMR) rate schedule with the Commission on March 1, 2017. The MMU identified several issues with the rate schedule and moved for the establishment of a hearing before an administrative law judge. In an order issued on April 26, 2017, the Commission noted that the RMR rate schedule had not been shown to be just and reasonable. The Commission accepted the RMR rate schedule with an effective date of May 1, 2017, and established a hearing and settlement judge procedures. The MMU participated in the settlement proceedings in 2017. All parties reached a final settlement agreement on January 5, 2018.

## ***Court and State Proceedings***

In 2017, the MMU addressed market topics in proceedings in federal courts and at state public utility commissions and legislatures:

### **Southern District of New York**

- Zero Emissions Credit (“ZEC”) Case No. 1:16-CV-8164(VEC). Motion for Leave to File Amicus Curiae Brief (January 6).

### **Northern District of Illinois Eastern Divisions**

- Zero Emissions Credit (“ZEC”) Case No. 12-cv-01164. Motion to Intervene as Plaintiff of the Independent Market Monitor for PJM (March 16).

### **United State Court of Appeals for the Seventh Circuit.**

- (Case No. 17-245) IMM Amicus Brief (September 12).

### **United State Court of Appeals for the District of Columbia**

- Appeal of FTR Orders Case No. 17-1101, 17-1106 and 17-1107. Petitioners Joint Reply Brief (October 25).

### **New Jersey Senate Environment and Energy Committee**

- Statement re Subsidies for Selected Nuclear Power Plants in New Jersey (December 4).

### **New Jersey Senate Environment and Energy Committee and the Assembly Telecommunications and Utilities Committee**

- Statement re Establishing Nuclear Diversity Certificate Program Bill No. 5330 (December 20).

## ***Federal***

- Testimony before the House Energy & Commerce Committee Energy Subcommittee, Washington, D.C. (October 5).
- Supplemental Testimony before the House Energy & Commerce Committee Energy Subcommittee, Washing, D.C. (November 27).

## ***Recommendations Regarding PJM Market Rules***

During 2017, the MMU presented information, analysis and recommendations to PJM Committees.<sup>25</sup>

### **Markets and Reliability Committee (MRC)**

- IMM Manual 15 Redlines (March 23).

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<sup>25</sup> OATT Attachment M § IV.D.

- IMM Position on Hourly Offer Capping, IDO Opt In, and Offer Cap Verification (August 24).
- Cost-Based Start Up and No Load in Market-Based Offers (August 24).
- IMM M11 Offer Cap Verification (September 28).
- M11 Offer Cap Verification (October 26).
- PRD Proposal (December 7).
- IMM MOPR-Ex Proposal Language (December 7).
- IMM MOPR-Ex Proposal (December 7).
- MOPR-Ex Proposal Language Revised 2 - (December 21).
- MOPR-Ex Proposal Language Revised 3 – (December 21).
- MOPR-Ex Proposal (December 21).
- IMM MOPR-Ex RPS Status Revisions (December 21).
- Energy Price Formation Problem Statement (December 21).
- Energy Price Formation Problem Statement Presentation (December 21).

### **MRC Special Session. MOPR-Ex**

- IMM MOPR-Ex RPS Status (December 12).
- IMM MOPR-Ex Proposal Language – Revised (December 12).

### **Members Committee/MC Webinar (MC)**

- Market Monitor Report (January 23).
- Market Monitor Report (February 21).
- Market Monitor Report (March 20).
- Market Monitor Report (April 24).
- Market Monitor Report (May 18).
- Market Monitor Report (June 19).
- Market Monitor Report (July 24).
- Market Monitor Report (September 25).
- Market Monitor Report (October 23).
- Market Monitor Report (November 27).

### **MC Special Session**

- 2016 State of the Market Report for PJM (March 23).

### **Market Implementation Committee (MIC)**

The MMU participated in discussions regarding changes to OA Schedule 2 and Manual 15 with respect to variable operating and maintenance costs in cost offers beginning in May 2017. The MMU provided a proposal to limit these costs to short run marginal costs in order to avoid potential market power abuse.



- Replacement Capacity (January 11).
- Black Start Minimum Tank Suction Level (February 8).
- IMM Manual 15 Edits (March 8).
- VOM Issue Charge and Problem Statement (April 12).
- Fuel Cost Policy Review Update (April 12).
- Fuel Cost Policies New MIRA Module (June 7).
- Black Start MSTL (June 7).
- Short Run Marginal Costs and VOM Costs (June 28).
- Market Path/Interface Pricing Point Alignment – Problem Statement (July 12)
- Market Path/Interface Pricing Point Alignment (July 12).
- IMM Manual 11 Revisions for Hourly Offer Updates (July 12).
- IMM Redline - PJM Edits (July 12).
- IMM M11 Redline - PJM Edits Accepted (July 12).
- 2017 FCP Annual Review Update (August 9).
- PJM-IMM Manual 11 Changes Differences (August 9).
- IMM Manual 11 9.1.1 Proposal (August 9).
- IMM Manual 11 2.3.6.1 Proposal (August 9).
- Market Path/Interface Pricing Point Alignment (September 13).
- IMM Problem Statement Long Term FTR Auction (September 13).
- IMM Issue Charge re Long Term FTR Auction (September 13).
- IMM Manual 11 Offer Cap Verification (September 13).
- IMM Manual 11 Order 831 Edits (September 13).
- Transmission Penalty Factors (October 11).
- Manual 11 Offer Cap Verification (October 11).

### **MIC Special Session. Opportunity Cost Calculator**

- Opportunity Cost Calculator (May 23).

### **MIC Special Session. VOM**

- CT/CC Overhaul Recovery Manual 15 Changes History (July 25).
- MMU Comments (August 31).

### **FC**

- MA 2015 Financial Results (March 26).
- (May 15).
- (August 23).
- (September 26).

## **Capacity Construct/Public Policy Senior Task Force (CCPPSTF)**

- IMM Recommendation Package (August 2).
- IMM CCPPSTF Proposal (September 11).
- Revised IMM MOPR-Ex Proposal for CCPPSTF (October 16).
- IMM MOPR-Ex Proposal for the CCPPSTF (November 1).
- IMM MOPR-Ex Proposal for the CCPPSTF (November 10).

## **Demand Response Subcommittee (DRS)**

In 2017, the MMU discussed with PJM and stakeholders and submitted a proposed solution option to the load management open registration issue, and price responsive demand. The MMU presented a solution option to the load management open registration issue at the January 27 meeting, and updates to the solution option at the February 22, March 15, April 7 and May 11 meetings. The MMU submitted a price responsive demand solution option on October 29, after the first read at the MRC and MC, but the price responsive demand vote was postponed until after the SODRSTF completed.

## **Distributed Energy Resources Subcommittee (DERS)**

In 2017, the MMU participated in several MIC special sessions discussing distributed energy resource definitions and DER participation in the wholesale and retail markets. This series of special sessions became a separate subcommittee in December 2017. At the December 15 session the MMU presented ideas for a solution matrix option for how distributed energy resources should be treated in the markets.

## **Incremental Auction Senior Task Force (IASTF)**

In 2017, the MMU engaged in discussions with PJM and stakeholders concerning the RPM Incremental Auction process and replacement capacity rules.

- Replacement Capacity and Speculative Behavior (May 10).
- Replacement Capacity and Speculative Behavior (May 31).
- MMU Incremental Auction Recommendation – Package B (June 27).
- Replacement Capacity Issues (June 27).
- Incremental Auction Design Changes, Package B (August 30).

## **MISO-PJM Joint and Common Market (JCM)**

The MMU participated in discussions concerning various PJM/MISO seams issues including cross border transmission planning, pseudo ties, interface pricing, revisions to the firm flow entitlement freeze date, coordinated transaction scheduling, Day-Ahead Firm Flow Entitlement Exchanges and the modelling of the Michigan-Ontario PARs.

## **PJM-NYISO Joint Initiative**

On March 10, the MMU participated in discussions concerning Ramapo PAR cost allocations.

## **Primary Frequency Response Senior Task Force (PFRSTF)**

The MMU participated in discussions at the PFRSTF regarding potential revisions to PJM Tariff, operating manuals, and interconnection standards to address FERC directives from Order No. 842.

## **Summer-Only Demand Response Senior Task Force (SODRSTF)**

The MMU participated in discussions concerning the possibility of a summer only demand response product. This task force started December 13, 2017.

## **Price Formation Education Session**

- Properties of Convex Hull Pricing (December 11).

## **Data Postings**

### ***Marginal Fuel Posting***

- 201611\_Marginal\_Fuel\_Postings.csv (January 3).
- 201612\_Marginal\_Fuel\_Postings.csv (February 1).
- 201701\_Marginal\_Fuel\_Postings.csv (March 1)
- 201702\_Marginal\_Fuel\_Postings.csv (April 7).
- 201703\_Marginal\_Fuel\_Postings.csv (May 8).
- 201704\_Marginal\_Fuel\_Postings.csv (June 9).
- 201705\_Marginal\_Fuel\_Postings.csv (July 12).
- 201706\_Marginal\_Fuel\_Postings.csv (August 10).
- 201707\_Marginal\_Fuel\_Postings.csv (September 1).
- 201708\_Marginal\_Fuel\_Postings.csv (October 10).
- 201709\_Marginal\_Fuel\_Postings.csv (November 9).
- 201710\_Marginal\_Fuel\_Postings.csv (December 1).

### ***PJM Load by State***

- PJM Load by State - 2016 (XLS) (February 23).

## **Other Activities**

### ***OPSI Advisory Committee***

The OPSI Advisory Committee is established pursuant to Section III.G of Attachment M of the OATT, which provides:

“There shall be an OPSI Advisory Committee comprised of five (5) representatives appointed by the Organization of

PJM States, Inc. The OPSI Advisory Committee shall meet with the Market Monitoring Unit on a regular basis and as otherwise necessary to receive and discuss information relevant to this Plan. In addition to the specific responsibilities regarding budget and termination set forth in Sections III.E and III.F, the OPSI Advisory Committee may provide advice to the Commission, Market Monitor, the PJM Board, stakeholder committees, and stakeholder working groups regarding any matter concerning the Market Monitor, Market Monitoring Unit or Market Monitoring Plan. Any formal advice shall be in writing and, subject to confidentiality provisions, shall be made publicly available.”

In 2017, the Market Monitor met with the OPSI Advisory Committee on Wednesday, October 4, 2017.

### ***Market Monitoring Unit Advisory Committee***

The Market Monitoring Unit Advisory Committee (“MMUAC”) is established pursuant to Section III.H of Attachment M of the OATT, which provides:

“There shall be an MMU Advisory Committee, chaired by the Market Monitor that is open to all stakeholders and representatives of Authorized Government Agencies. The MMU Advisory Committee shall act as a liaison between stakeholders and the MMU and shall provide advice from time to time on matters relevant to the MMU's responsibilities under this Plan. The MMU Advisory Committee shall have no authority to direct, supervise, review, or otherwise interfere with the functions of the MMU under this Plan, nor any authority to terminate or propose to terminate the Market Monitor.”

The Market Monitor convened a meeting of the MMUAC on December 1, 2017. The Market Monitor requested comments from stakeholders concerning the MMU's implementation of the PJM Market Monitoring Plan. The MMU discussed: its position opposing various proposals for subsidies for units by fuel type; its concerns about aggregate market power and the lack of adequate tariff provisions to mitigate aggregate market power; the differences in day-ahead and real-time models and the implications for virtuals; and the need for reform of the Minimum Offer Price Rule (MOPR).