

150 FERC ¶ 61,132  
UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Cheryl A. LaFleur, Chairman;  
Philip D. Moeller, Tony Clark,  
and Norman C. Bay.

Coordination Across the Midcontinent Independent  
System Operator, Inc./PJM Interconnection, L.L.C.  
Seam

Docket No. AD14-3-000

ORDER REQUESTING ADDITIONAL INFORMATION

(Issued February 24, 2015)

1. On January 22, 2015, PJM Interconnection, L.L.C. (PJM) and Midcontinent Independent System Operator, Inc. (MISO, and collectively RTOs), their independent market monitors, and representatives of the Organization of PJM States and the Organization of MISO States discussed their progress on various joint and common market initiatives at the Commission's Open Meeting.<sup>1</sup> In this order, we request that the RTOs and their independent market monitors provide further information on the specific issues of (1) interface pricing; (2) capacity deliverability; (3) Day-Ahead market coordination; (4) modeling of the Ontario/Michigan phase angle regulators for congestion management; (5) Firm Flow Entitlement Freeze Date; and (6) use of commercial flow in the Market-to-Market process. The Commission will use this information to understand what, if any, additional steps the Commission should take to improve the efficiency of operations at the PJM/MISO seam.

**I. Background**

2. The Commission's requirement that the RTOs participate in a joint and common market originated in 2002, when the Commission conditionally accepted the choices of certain utilities in the eastern portion of the Midwest to join MISO or PJM.<sup>2</sup> The

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<sup>1</sup> See *Sunshine Act Meeting Notice*, 80 Fed. Reg. 2926-02 (Jan. 21, 2015).

<sup>2</sup> *Alliance Cos.*, 100 FERC ¶ 61,137 (2002), *order on clarification*, 102 FERC ¶ 61,214, *order on reh'g and clarification*, 103 FERC ¶ 61,274, *order denying reh'g and granting clarification*, 105 FERC ¶ 61,215 (2003), *appeal docketed sub nom. Am. Elec. Power Serv. Corp. v. FERC*, No. 03-1223 (D.C. Cir. 2003) (collectively, *Alliance Orders*).

Commission found that their decisions to join PJM instead of MISO could result in pricing differentials and trading barriers between the systems (seams) that would be inconsistent with the scope and configuration requirements of Order No. 2000.<sup>3</sup>

However, the Commission found that, with certain conditions to address and mitigate the impact of seams, utilities' decisions to join PJM would be consistent with the scope and configuration requirements of Order No. 2000. Accordingly, the Commission accepted those utilities' choices to join PJM, subject to, among other conditions, the formation of a functional joint and common market across the two organizations.<sup>4</sup> In order to adequately monitor the RTOs' progress toward a joint and common market, the Commission required them to file, for informational purposes, an implementation plan for achieving a joint and common market and progress reports every 60 days.<sup>5</sup>

3. In 2007, in an order dismissing a complaint,<sup>6</sup> the Commission found that, because of the progress of the RTOs in developing the joint and common market, as well as their commitment to maintain an on-going joint and common market stakeholder process, the RTOs had satisfied the joint and common market condition established in the Alliance Orders. The Commission therefore ended the obligation for the RTOs to file periodic reports on their progress toward developing and implementing a joint and common market.<sup>7</sup>

4. Joint and common market stakeholder meetings were held less frequently after the Commission ended the reporting requirement in 2007. The RTOs conducted formal joint and common market discussions three times in 2008, once in 2009, and held no discussions in 2010 or 2011. They resumed regular meetings in 2012, which continue to be held every three months. According to PJM's webpage on the joint and common

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<sup>3</sup> *Regional Transmission Organizations*, Order No. 2000, FERC Stats. & Regs. ¶ 31,089 (1999), *order on reh'g*, Order No. 2000-A, FERC Stats. & Regs. ¶ 31,092 (2000), *aff'd sub nom. Pub. Util. District No. 1 of Snohomish County, Washington v. FERC*, 272 F.3d 607 (D.C. Cir. 2001).

<sup>4</sup> *Alliance Cos.*, 100 FERC ¶ 61,137 at PP 37-40. The Commission also required the utilities to propose a solution that would effectively hold harmless utilities in Wisconsin and Michigan from any loop flows or congestion that resulted from the proposed RTO configuration. *Id.* P 53.

<sup>5</sup> *Id.* P 55. The Commission subsequently extended the time between reports to every 120 days. *See Wisconsin Pub. Serv. Corp.*, 114 FERC ¶ 61,277, at P 30 (2006).

<sup>6</sup> *Wisconsin Pub. Serv. Corp.*, 118 FERC ¶ 61,089 (2007).

<sup>7</sup> *Id.* PP 49-50.

market initiative, “[w]ork to date has enhanced coordination at the seam, but operational experience and stakeholder interest have triggered a need to investigate further enhancements. In order to provide rigorous management and tracking of this effort, the RTOs are reinstating the [j]oint and [c]ommon [m]arket process and infrastructure.”<sup>8</sup>

5. In April 2013, the Commission directed the RTOs to make presentations at the Commission regarding the joint and common market initiative, and invited the Organization of MISO States, Organization of PJM States, and the independent market monitors for MISO and PJM to make presentations.<sup>9</sup>

6. In December 2013, the Commission directed staff to participate in the joint and common market meetings. The Commission stated that “[s]taff’s participation in this process will aid the Commission in monitoring the RTOs’ progress in the initiatives described in their [September 26, 2013 informational filing] consistent with the schedule set forth therein.”<sup>10</sup> Staff has participated in a number of joint and common market meetings since that order.

## **II. January 22, 2015 Joint and Common Market Discussion**

7. The RTOs, their independent market monitors, and representatives of the Organization of PJM States and the Organization of MISO States discussed the status of the joint and common market initiative at the January 22, 2015 Commission meeting. According to the RTOs,<sup>11</sup> they have completed work on, or have reached agreement on and are implementing changes to address the following issues: RTO-to-RTO data exchange and transparency; interchange scheduling business rule alignment; transmission outage coordination; treatment of the Ontario/ITC phase angle regulators in the Market-to-Market process; financial transmission rights market coordination; interconnection and

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<sup>8</sup> PJM, *PJM/MISO Joint and Common Market Initiative* (Jul. 2013), available at <http://www.pjm.com/committees-and-groups/stakeholder-meetings/stakeholder-groups/pjm-miso-joint-common.aspx>.

<sup>9</sup> *Capacity Deliverability Across the Midwest Indep. Transmission Sys. Operator, Inc./PJM Interconnection, L.L.C. Seam*, 143 FERC ¶ 61,008 (2013).

<sup>10</sup> *Capacity Deliverability Across the Midwest Indep. Transmission Sys. Operator, Inc./PJM Interconnection, L.L.C. Seam*, 145 FERC ¶ 61,258, at P 9 (2013).

<sup>11</sup> See MISO and PJM, JCM Work Plan Update, Docket No. AD14-3-000 (filed Feb. 10, 2015).

transmission service request queue coordination; and market participant-funded upgrades and incremental auction revenue rights requests.<sup>12</sup>

8. The RTOs indicated that they have made progress, but have not reached solutions for the following issues: interface pricing; capacity deliverability; Day-Ahead market coordination; modeling of the Ontario/Michigan phase angle regulators for congestion management; update of the Firm Flow Entitlement Freeze Date; use of commercial flows in the Market-to-Market process; interchange optimization via coordinated transaction scheduling; and cross-border planning.<sup>13</sup>

9. In this order, the Commission requests further information on the first six of these issues. With respect to the remaining issues, the Commission has an ongoing proceeding regarding cross-border planning,<sup>14</sup> and the RTOs have an active stakeholder process to implement interchange optimization via coordinated transaction scheduling.<sup>15</sup>

### **III. Request for Additional Information**

10. We request that the RTOs and their independent market monitors, either jointly or separately, provide information for each of the six issues below, regarding (1) any delays or impediments to progress; (2) any proposed solutions to the issue; (3) any objections to or unintended consequences associated with the proposed solutions; (4) how the RTOs plan to resolve the issue; and (5) a proposed timeline describing next steps and when the RTOs expect to resolve the issue and/or make filings at the Commission. We also request that the RTOs and their independent market monitors submit additional information specific to certain issues, as described below. The Commission will use this information to understand what, if any, additional steps the Commission should take to

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<sup>12</sup> *Id.*

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

<sup>14</sup> *Northern Indiana Public Service Co. v. Midcontinent Indep. Sys. Operator, Inc. and PJM Interconnection, L.L.C.*, 149 FERC ¶ 61,248 (2014).

<sup>15</sup> PJM, *Issue Details: Efficiency of PJM MISO Real Time Interchange* (Jan. 2012), available at <http://pjm.com/committees-and-groups/issue-tracking/issue-tracking-details.aspx?Issue={89D2BB71-DE1A-44C3-BE84-E610630D2AFC}>; see also PJM, *PJM/MISO Coordinated Transaction Scheduling* (Jan. 22, 2015), available at <http://pjm.com/~media/committees-groups/committees/mrc/20150122/20150122-item-03-pjm-miso-coordinated-transaction-scheduling.aspx>.

improve the efficiency of operations at the PJM/MISO seam. The RTOs and their independent market monitors should file the information in this docket by April 10, 2015. Comments on these filings will be due April 27, 2015.

**A. Interface Pricing**

11. In order to price exports and imports an RTO must determine prices at its interface with a neighboring RTO or balancing authority. A price is calculated that is used to pay a resource for its import and a price is calculated to charge the resource for its export. The PJM/MISO border has multiple paths over which power could flow between the RTOs, but the RTOs do not know which path will actually be used when they dispatch their systems, so the RTOs calculate each interface price using an average of many pricing nodes. The methods in use by PJM and MISO have been called into question by MISO's independent market monitor.<sup>16</sup> MISO's independent market monitor states that when using these interface prices in the Market-to-Market process to solve a transmission constraint, both RTOs are calculating shadow prices on the constraint, and therefore both RTOs include the congestion component on that constraint in their price calculation. MISO's independent market monitor states that this leads to over-counting of the congestion component and creates inefficient incentives for interchange.<sup>17</sup>

12. Specifically, for the issue of interface pricing, we request that the RTOs and their independent market monitors provide information on (1) the process they have used to study the issue; (2) any efforts to develop a joint network model to study the issue; (3) any efforts to jointly study actual dispatches to determine the scale of the issue; and (4) how they have studied the unintended consequences of any of the proposed solutions discussed, the results of those studies, and their plans for additional studies.

**B. Capacity Deliverability**

13. In 2012, based on comments by MISO and other parties in the MISO resource adequacy construct proceeding regarding barriers to capacity deliverability,<sup>18</sup> the

Commission requested more comments on capacity deliverability and seams issues,<sup>19</sup> and elicited presentations on the matter.<sup>20</sup> Parties disagreed on a number of issues related to

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<sup>16</sup> See Potomac Economics, Joint and Common Market Update: Interface Pricing Flaw, Docket No. AD12-16-000, at 2 (filed Jan. 22, 2015).

<sup>17</sup> See *id.*

<sup>18</sup> See *Midwest Indep. Transmission Sys. Operator, Inc.*, 139 FERC ¶ 61,199 (2012).

the amount of potential deliverability between the RTOs and impediments to deliverability between them. Additionally the RTOs have identified the following issues to be resolved: (1) preventing transmission cost shifts between RTOs from transmission upgrades; (2) developing real-time operational protocols to ensure delivery of energy with capacity commitments during emergency conditions; (3) establishing capacity import and export limits where they do not already exist, thus ensuring the reliable deliverability of capacity commitments;<sup>21</sup> (4) treatment of existing firm transmission rights if firm scheduling rights are awarded to resources that clear in capacity auctions; and (5) establishing Firm Flow Entitlements in the Market-to-Market congestion management process given committed capacity resources.<sup>22</sup>

14. The RTOs state that they have completed a coordinated study on deliverability despite their different modeling approaches. The study indicates that more than 96 percent of MISO and PJM units are jointly deliverable to the aggregate MISO and PJM load footprint and the total transmission capability between the two systems is quite significant. After comparing study results with existing transmission system utilization, the RTOs found that the transmission capability in the MISO to PJM direction is fully subscribed while the transmission capability in the PJM to MISO direction is minimally utilized for capacity. Therefore, there could be benefit in the PJM to MISO direction, even in the near-term.<sup>23</sup>

15. For the issue of capacity deliverability, we request that the RTOs and their independent market monitors provide information on (1) any reliability problems associated with modeling capacity in each RTO as a single product across the two

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<sup>19</sup> See *Capacity Deliverability Across the Midwest Indep. Transmission Sys. Operator, Inc./PJM Interconnection, L.L.C. Seam*, 139 FERC ¶ 61,200 (2012).

<sup>20</sup> See *Capacity Deliverability Across the Midwest Indep. Transmission Sys. Operator, Inc./PJM Interconnection, L.L.C. Seam*, 143 FERC ¶ 61,008 (2013).

<sup>21</sup> On April 22, 2014, the Commission approved revisions that PJM proposed to the Reliability Assurance Agreement among load-serving entities in the PJM region and the PJM Open Access Transmission Tariff to recognize limits on the amount of capacity from external generation resources that can be reliably committed in the PJM forward capacity auctions. *PJM Interconnection, L.L.C.*, 147 FERC ¶ 61,060 (2014).

<sup>22</sup> MISO and PJM, *Capacity Deliverability Presentation* (July 2014), available at <http://www.miso-pjm.com/working-groups/joint-and-common-wg.aspx>.

<sup>23</sup> MISO and PJM, Presentation at the January 22 Commission Meeting, Docket No. AD14-3-000, at 2 (filed Feb. 10, 2015).

markets, (2) the amount of capacity that can flow across the seam in each direction, (3) any differences in assumptions and modeling between the RTOs, and (4) any impediments to treating capacity as a single product.

### C. Day-Ahead Market Coordination

16. The RTOs continue to work on procedures that will increase the efficiency of their systems in the Day-Ahead market. They have already established Day-Ahead data exchange, which helps to optimize operations in the Day-Ahead market by integrating more information from each RTO into commitment decisions.<sup>24</sup> The next priority for improving Day-Ahead Market Coordination is Firm Flow Entitlement Exchange.<sup>25</sup>

17. Firm Flow Entitlements are based on historic flows from 2004 (further discussed under the Firm Flow Entitlement Freeze Date, below), and there have been substantial changes to both RTOs in the last decade. Therefore, real-time transfer capability is often greater than the Firm Flow Entitlement used in the Day-Ahead market. Exchanging information and unused capacity can increase efficiencies in the Day-Ahead market, better align the operations of the Day-Ahead and Real-Time markets, and enhance revenue adequacy for other markets, such as financial transmission rights. Currently, the RTOs are performing studies regarding the impacts of Day-Ahead Firm Flow Entitlement Exchange. Prior to the third quarter of 2015, the RTOs expect to implement Day-Ahead Firm Flow Entitlement Exchange for flowgates expected to be congested in the Real-Time market, which will settle based on the shadow prices of those constraints.<sup>26</sup> After that, the RTOs will further examine the possibility of economic allocation for Day-Ahead Firm Flow Entitlement Exchange of other flowgates, and what will be required for implementation.

18. Regarding Day-Ahead market coordination, we request that the RTOs and their independent market monitors provide information regarding (1) any differences in the RTOs' modeling and assumptions; (2) what the RTOs would need to do to implement Day-Ahead market coordination; and (3) the methodology for flowgate pricing and Firm Flow Entitlement Exchange, and any differences in implementation of that methodology between the Day-Ahead and Real-Time processes.

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<sup>24</sup> MISO and PJM, *Improved Day-Ahead Market Coordination 2* (Nov. 2014), available at <http://www.pjm.com/~media/committees-groups/stakeholder-meetings/pjm-miso-joint-common/20141110/20141110-item-01-improving-da-market-coordination.ashx>.

<sup>25</sup> *Id.* at 3, 4.

<sup>26</sup> *Id.* at 10.

**D. Modeling the Ontario/Michigan Phase Angle Regulators**

19. The Ontario/Michigan phase angle regulators consist of five phase angle regulators located on four 230 kV transmission lines between Ontario and Michigan. Beginning on July 18, 2012, these devices allowed for full control of the Ontario/Michigan interface, allowing them to counteract unscheduled loop flow around Lake Erie.<sup>27</sup> Because of the impact of Lake Erie loop flow on the calculation of Market-to-Market flows and entitlements, it is important that the influence of the phase angle regulators be modeled correctly. However, due to a lack of historical operating experience with all phase angle regulators in-service, there is little consensus on what performance should be expected. Currently, the phase angle regulators are modeled as a free-flowing tie line (i.e., as though the phase angle regulators are providing no control) under all circumstances.

20. For the issue of modeling the Ontario/Michigan phase angle regulators for congestion management, we request that the RTOs and their independent market monitors provide information on (1) any differences in modeling or assumptions, (2) how they each model the phase angle regulators in the Day-Ahead and Real-Time market, and (3) what information each RTO shares with the other RTO on phase angle regulator settings during the Day-Ahead and Real-Time markets.

**E. Use of Commercial Flow in Market-to-Market Process**

21. In the Market-to-Market process, market flow is the flow on a specified flowgate as a result of dispatch of generating resources serving market load within an RTO market. Market flow is different than the actual flow measured on monitored flowgates, referred to as commercial flow, because it ignores unscheduled flows. The calculation of the market flow is important because it determines the flow contribution on each flowgate which ultimately is used for determining the Market-to-Market payments associated with under or over usage of the system. The RTOs are reexamining the market flow calculations specific to the treatment of imports and exports to ensure consistency with the flow-based pricing systems utilized by the RTOs. Proper alignment of commercial

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<sup>27</sup> See Independent Electricity System Operator, MISO, PJM, *Ontario-Michigan Interface PAR Performance Evaluation Report* (Jan. 2014), available at <http://www.miso-pjm.com/~media/pjm-jointcommon/downloads/ontario-michigan-interface-par-performance-evaluation-report.ashx>.

flow with Market-to-Market market flow ensures that balancing congestion and Market-to-Market payments can offset each other when each RTO keeps to their Firm Flow Entitlement values.<sup>28</sup>

22. The RTOs are coordinating and identifying impacts of using commercial flow for Market-to-Market settlement. PJM has shared its proposal for using commercial flow for the Market-to-Market process with MISO and Southwest Power Pool, Inc. (SPP). MISO and SPP are reviewing the proposal and will provide PJM their comments.

**F. Firm Flow Entitlement Freeze Date**

23. Certain components of the calculations utilized to determine the Firm Flow Entitlements that are used to determine Market-to-Market settlements rely on the establishment of a historic reference date on which firm point-to-point reservations and network resources are based, known as the “Freeze Date.” The Freeze Date is April 1, 2004 based on the date that PJM and MISO began Market-to-Market coordination. The RTOs and their stakeholders have agreed that the concept of using a Freeze Date, as well as what that specific date to use, should be revisited given that the period since the current Freeze Date is more than 10 years.<sup>29</sup>

24. MISO and PJM have presented guiding principles for alternatives to the Freeze Date to joint and common market stakeholders, and are currently working with the Congestion Management Process Working Group.<sup>30</sup>

25. Regarding the Firm Flow Entitlement Freeze Date, we request that the RTOs and their market monitors provide information regarding (1) the status of the Congestion Management Process Working Group process, and (2) any specific examples of Firm Flow Entitlements that are out of date based on generator retirements or new transmission construction.

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<sup>28</sup> MISO and PJM, *JCM Drill Down Report 8* (Nov. 2014), available at <http://www.miso-pjm.com/working-groups/joint-and-common-wg.aspx>.

<sup>29</sup> *Id.* at 4.

<sup>30</sup> MISO and PJM, *Freeze Date Update Presentation* (Nov. 2014), available at <http://www.miso-pjm.com/working-groups/joint-and-common-wg.aspx>.

The Commission orders:

(A) MISO, PJM, and their independent market monitors are hereby requested to file additional information, within 45 days of the date of this order, as discussed in the body of this order.

(B) Reply comments will be due 15 days after the RTOs and independent market monitors file the additional information.

By the Commission. Commissioner Honorable is not participating.

( S E A L )

Nathaniel J. Davis, Sr.,  
Deputy Secretary.