

# MISO-PJM JOA Biennial Review

Midcontinent ISO  
PJM Interconnection  
1/20/2016

## 1. Background

On January 4, 2011, Midwest<sup>1</sup> Independent Transmission System Operator, Inc. (MISO) and PJM Interconnection, LLC (PJM) filed a joint Settlement Agreement to resolve two MISO complaints against PJM and one PJM complaint against MISO. On June 6, 2011, the Federal Energy Regulatory Commission (FERC) approved the Settlement, and accepted the proposed tariff revisions, effective the date of the order, subject to a compliance filing.

In the Settlement, MISO and PJM agreed to conduct a review of the processes and procedures used to implement the Joint Operating Agreement (JOA) between the two organizations. Accordingly, Utilicast, LLC was retained jointly by MISO and PJM to conduct this review. Utilicast completed the JOA Baseline Review report on January 20, 2012. This review found that both MISO and PJM were in conformance with the JOA provisions, but that there were opportunities for increased communication and documentation that might proactively prevent future conflicts. These items were detailed in a series of eighteen findings and recommendations.

The Settlement Agreement also specifies that beginning two years after the issuance of the JOA Baseline Review and every two years thereafter, MISO and PJM shall conduct a review of the changes made to each Party's processes used to implement the JOA since the previous review, or in the case of the first review, since the JOA Baseline Review. The first MISO-PJM Biennial Review was finalized on January 20, 2014, and addressed the following items: Change Management Logs, status of JOA baseline review recommendations, and FERC Orders.

This report is the second MISO-PJM JOA Biennial Review, and follows a similar format as the report published in 2014 with sections addressing the following items: Change Management Logs, status of 2014 MISO-PJM Biennial Review recommendations, and FERC filings.

The Change Management Log is a document which is jointly maintained by PJM and MISO and tracks systemic changes and process and procedure changes on an ongoing basis. That Log is detailed in section 2 of this report. The status of the recommendations included in the 2014 Biennial Review is discussed in Section 3. Section 4 covers the FERC Orders section received relating to the MISO-PJM JOA that have been implemented since the 2014 Biennial Review.

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<sup>1</sup> Midwest Independent Transmission System Operator, Inc. changed its name to Midcontinent Independent System Operator, Inc. on April 26, 2013.

## 2. Change Management Log

### 2.1. Change Management Log Summary

The following table is a summary of the implemented changes in processes or systems as detailed in the Change Management Log.

Item	Name	Description	Status	Date
1	PJM New Version of eMFC	PJM's new version of the eMFC includes code that will be moved from the data manager to the eMFC. In addition, the LSA calculation needs to be corrected.	Implemented	1/15/2014
2	ELMP	PJM will be modifying the handling of data from MISO.	Implemented	4/7/2014
3	MISO marginal zone methodology	MISO will apply the Marginal Zone methodology for import and export tagged transactions in the Market Flow calculation, FFL and FFE calculations, and IDC. MISO will change from the Slice-of-System method to the Marginal Zone method in the market flow calculation, and will change from the Point-of-Receipt (POR)/Point-of-Delivery (POD) method to the Marginal Zone method in the FFL and FFE calculations.	Implemented	8/8/2014
4	PJM Market Flow Calculation change to Marginal Zones	PJM will be changing the transaction impact calculation method for Flowgate Market Flow calculations to the 'Marginal Zone Participation Factor' method.	Implemented	8/8/2014
5	MISO Market Flow calculation for negative control zone loss	Negative control zone loss will be ignored while summarizing total losses in the market flow calculation	Implemented	3/1/2015
6	PJM market flow calculation change for unmapped load	PJM's handling of unmapped load was not consistent with how it handled unmapped generation. PJM is implementing this change to achieve consistency within PJM's unmapped load and gen in the Market Flow calculations.	Implemented	7/14/2015
7	MISO Market Flow calculation for unmapped generation and negative threshold load	The change is needed to address the treatment of unmapped generation and negative threshold load whose impacts are currently ignored in the MISO market flow calculation process.	Implemented	7/14/2015

<b>Item</b>	<b>Name</b>	<b>Description</b>	<b>Status</b>	<b>Date</b>
<b>8</b>	PJM Quad Cities ICAP logic in Market Flow calculation	This change is needed to apply the consistency and similar granularity in the market flow, FFE/FFL and IDC Tag Impact calculation for the treatment of Quad Cities JOUs.	Implemented	9/8/2015
<b>9</b>	MISO Quad Cities ICAP logic in market flow calculation	The change is needed to apply the consistency and similar granularity in the market flow, FFE/FFL and IDC Tag Impact calculation for the treatment of Quad Cities JOUs.	Implemented	9/8/2015
<b>10</b>	PJM FFE Consistency Among RTO's Enhancement	The reason these changes are occurring is to apply consistency among PJM and MISO with respect to the final Firm Flow Entitlement (FFE) hourly integrated calculation.	Implemented	8/12/2015
<b>11</b>	Separate historical impact and allocation for MISO and MHEB	Per MISO-PJM-SPP Memorandum of Understanding signed on August 10, of 2015.	Implemented	11/5/2015

## 2.2.Discussion

The Change Management Log is a jointly maintained document that details any system or process change related to the MISO/PJM Joint Operating Agreement. Each entry on the Change Management Log is agreed to by MISO and PJM, and it is used as a vehicle to ensure all parties are informed of changes that could potentially impact the implementation of the JOA. Items in the log are classified as open or closed. Open items are undergoing discussion or are in the process of being implemented. Closed items are assigned a status of approved if implemented. The Change Management Logs are discussed on a weekly basis and posted to the MISO and PJM websites on a quarterly basis.

The following section summarizes the implemented changes per the log:

1. PJM New Version of eMFC – PJM performed an exercise to streamline the processing of data that was feed into the calculator and what was processed by the calculator itself. The change was to move code from a preprocessing data manager and put the processing directly into the calculator. In addition at the time of the code movement a small defect within the LSA calculation was also corrected.
2. ELMP – PJM had been processing the ex-post and ex-anti prices from MISO by copying the values. In order to prepare for a change that MISO was making to their internal processing PJM cleaned up the handling of the code by appropriately mapping each value to the incoming data from MISO.
3. Consistent Treatment of Transactions – MISO was looking to align the methodology for the treatment of tagged transactions in the Market flow calculation, the Firm Flow Limit, Firm Flow Entitlement, and the impact calculations in IDC. The way to align was moving them all to the marginal zone methodology.
4. Market Flow Calculation change to Marginal Zones - PJM changed the transaction impact calculation method for aforementioned Flowgate Market Flow calculations to the 'Marginal Zone Participation Factor' method. This change required Market Flow Calculator changes and Bulk Data Exchange changes.

Changes 3 & 4 were part of a three party agreement between PJM, MISO and SPP to allow for additional granularity and consistency for reciprocally (and non reciprocally) coordinated flowgates.

5. MISO MF calculation for negative control zone loss – This change to ignore the negative control zone loss while summarizing total loss was needed to align the calculator with the design specification as they are written and interpreted.
6. PJM's market flow calculation change for unmapped load - PJM loads could be classified as unmapped under two scenarios. They either have a megawatt value and

no shift factor (unmapped type 1) or have a megawatt value and cannot be mapped to a local balancing authority (unmapped type 2), PJM does not pro-rata adjust PJM's mapped load to account for unmapped type 1 load. This practice is inconsistent with PJM's unmapped generation treatment for this unmapped type. This change management ticket is initiated to pro-rata adjust PJM's mapped load to account for unmapped load type 1, which will introduce a market flow logic change to consistently treat unmapped gen and load.

7. MISO MFC for treating unmapped generation and negative threshold load - Any MISO generation whose MW output is greater than 0MW but has no generator shift factor is defined as unmapped generation. Any MISO negative load whose output is greater than a pre-defined threshold in absolute value is defined as negative threshold load. It will be treated as a unit with positive generation output and the generation impact will be included in the MISO market flow calculation. For any unmapped generation or negative threshold load, the unit MW will first be distributed among all the mapped units in the same control area on a pro-rata basis. If unsuccessful, the unit MW will then be distributed to all RTO mapped generations proportionally.
8. PJM Quad Cities (QC) ICAP MFC - For each QC unit PJM will calculate the total tag schedule MW values. PJM will add the QC tags to calculate this value. For each QC unit PJM will calculate the QC Cap value by calculating the lesser of (ICAP\*25%), QC tagged mw values, or real-time unit output. For each QC unit PJM will calculate the Excess MWs that will be contributing towards the RTO Exports calculation. Excess will be equal to (Total Schedule – CAP). For each QC unit PJM will determine if the Excess MWs are greater than 0.
  - If Excess > 0 for each QC unit, schedules will be scaled down on a pro-rata basis to develop unit specific export tags and RTO exports tags.
  - If Excess < 0 no adjustments are made to tags.

Once each QC unit specific tag MWs and RTO exports tag MWs are identified, use the unit specific tag values to adjust each QC unit output and RTO export tag values to adjust for RTO exports in PJM's Market Flow calculation.

9. MISO Quad Cities (QC) ICAP logic in market flow calculation - For each QC unit, MISO calculates the total tag schedule MW value. For each QC unit, MISO will use the least value among (ICAP\*25%), QC tagged MW values, and real-time unit output to determine the load-specified adjustment for MEC load. The RTO import will be reduced by the MEC load adjustment to avoid double-counting.

10. PJM FFE - Consistency Among RTO's Enhancement –
  - Rather than using the 15 minute FFE calculations in The settlement calculations, PJM will recalculate the 15 minute FFE data during its settlement calculation process that occurs a day after the operating day, which will then be used to calculate the hourly FFE settlement calculations.
  - PJM will no longer round the 15 minute FFE data, but will continue to round the average of the four 15 minute values that makeup the hourly FFE settlement values.
  
11. Separate historical impact and allocation for MISO and MHEB
  - MHEB will be treated as individual entity in CMP process, including historical impact calculations, allocations, and flowgate coordination.
  - MISO historical impacts will no longer include MHEB's GTL and PTP impacts.

### 3. Status of 2014 Biennial Review Recommendations and MISO/PJM Responses

In the 2014 JOA Biennial Review report, issued January 20, 2016, MISO and PJM staff identified multiple recommendations to improve the coordination of M2M activities between MISO and PJM. The following section summarizes the recommendations and their current status. When necessary, section 3.2 provides a narrative description of recommendation language and MISO’s and PJM’s responses to those recommendations and corresponding action items:

#### 3.1 Summary

Topics are ordered based on Status in following table. Ongoing items are listed first and Completed items listed later.

The status Complete means the initial scope as identified by previous Biennial Review has been completed and any future scope of work will be developed as needed. Regardless of status, PJM and MISO are always looking to appropriately enhance any aspects of their joint coordination defined in the JOA.

2014 Biennial	Topic	2014 Biennial Recommendation	Description	Status
3.2.1	Documentation	Continue Discussions on the following documents: <ul style="list-style-type: none"> <li>• Outage Coordination</li> <li>• Dynamic Flowgate Procedure</li> <li>• M2M Flowgate Process Document</li> <li>• Less-than-Optimal Dispatch Procedures</li> <li>• Flowgate Determination Guides</li> </ul>	<ul style="list-style-type: none"> <li>• Completed:               <ul style="list-style-type: none"> <li>○ Dynamic Flowgate Procedure</li> <li>○ Less-than-Optimal Dispatch Procedures</li> <li>○ Flowgate Determination Guide</li> <li>○ M2M Flowgate Process Document</li> </ul> </li> <li>• Ongoing:               <ul style="list-style-type: none"> <li>○ Market Flow Methodology</li> <li>○ DA M2M FFE Exchange</li> <li>○ Outage Coordination</li> <li>○ MI-ONT PARS</li> </ul> </li> </ul>	Ongoing

2014 Biennial	Topic	2014 Biennial Recommendation	Description	Status
<b>3.2.8</b>	Real Time Market Flow Determination	MISO and PJM will finalize the Market Flow Calculation methodology document.	MISO and PJM are working to complete a joint document that describes their market flow calculations. Targeted completion is Q2 2016.	<b>Ongoing</b>
<b>3.2.11</b>	Day-Ahead Energy Market Coordination	Revisit the JOA language regarding FFE sharing provisions. The two parties have been jointly working through the MISO/PJM JCM Initiative to develop a process that will allow this provision to be utilized through a coordinated study. MISO and PJM should continue to work towards their Q1 2016 completion date for the effort.	MISO and PJM have developed a process for establishing Day Ahead limits and sharing the Day Ahead FFE. Work in progress. Targeting implementation by Q1 2016 upon approval from FERC.	<b>Ongoing</b>
<b>3.2.2</b>	Modeling	MISO and PJM will review the current exchange of quarterly EMS model information and develop/implement improved coordination processes. Changes/improvements to these processes will be provided via each RTO's stakeholder reporting process.	Agreed to improved coordination. During quarterly EMS model updates both RTOs are exchanging model changes to identify/update M2M flowgate definition changes as needed.	<b>Complete</b>
<b>3.2.3</b>	Data Exchange	MISO and PJM are targeting to add the interim Flowgate allocation data and interim Market Flow calculator data to the data exchange by the end of 2014.	MISO and PJM have documented their market flow methodologies such that exchanging intermediate data is no longer necessary.	<b>Complete</b>
<b>3.2.4</b>	Outage Coordination	Continue with MISO/PJM JCM Initiatives.	Initial scope is completed, additional scope to be completed if addressed through the JCM process.	<b>Complete</b>

2014 Biennial	Topic	2014 Biennial Recommendation	Description	Status
3.2.5	Change Management	MISO and PJM should continue to utilize the change management process.	MISO and PJM continue to utilize the change management process that has been established, including process documentation, notice forms, SharePoint site, Quarterly change management log posting.	Complete
3.2.6	Biennial Review	MISO and PJM will continue to track all settlement agreement related items, including the Biennial Review. Both RTOs have ongoing work plans to review M2M process related changes on a biennial basis.	MISO and PJM will continue to track all settlement agreement related items as part of weekly coordination call.	Complete
3.2.7	Flowgate Determination	The parties are currently developing a Flowgate creation procedure document for real-time M2M Flowgates whose qualifying coordination tests cannot be run prior to the need date for the Flowgate.	The Flowgate Process Guide satisfies this topic. Additionally, MISO and PJM agreed to use 35% market flow threshold for 138 kV or below facilities. Enhancements made to ensure flowgate tests are performed in timely manner.	Complete
3.2.9	Market Flow Limit Determination – Forward Coordination Process	MISO and PJM do not believe future action is needed for this topic.	Procedure on conditions that may trigger a review of Historic Firm Flow Values and Ratios. MISO and PJM do not believe future action is needed for this topic.	Complete

2014 Biennial	Topic	2014 Biennial Recommendation	Description	Status
3.2.10	M2M Coordination	MISO and PJM should continue to work together to finalize the M2M Flowgate Process document and the procedure for dynamic flowgate creation.	MISO and PJM worked on M2M Flowgate Process and the dynamic flowgate creation documents.	Complete
3.2.12	Purpose of Market to Market	MISO and PJM should continue to work together to finalize the M2M Flowgate Process document and the procedure for dynamic flowgate creation.	MISO and PJM created following documents: <ul style="list-style-type: none"> <li>• Flowgate Process Document</li> <li>• Dynamic Flowgate Procedure</li> </ul>	Complete
3.2.13	Minimizing Less-Than-Optimal Dispatch	MISO and PJM should continue with the weekly coordination discussions.	MISO and PJM had FERC filings as part of settlement agreement (EL13-75-000) to meet the requirements. MISO and PJM are continuing with the weekly coordination discussions.	Complete
3.2.14	Use of M2M whenever binding a M2M Flowgate	Progress to date has met the JOA requirement for initiating M2M. No future action is needed.	Use of M2M whenever binding on an M2M flowgate is part of routine weekly review.	Complete
3.2.15	Most Limiting Flowgate	MISO and PJM should continue to work together to finalize the M2M Flowgate Process document and the procedure for dynamic flowgate creation.	The Flowgate Process Document is a broadly scoped document that includes using the most limiting flowgate and dynamic flowgate creation. There is also a standalone document on dynamic flowgate creation.	Complete

2014 Biennial	Topic	2014 Biennial Recommendation	Description	Status
3.2.16	Substitute Flowgate	MISO and PJM will continue to work together to finalize the M2M Flowgate Process document.	The Flowgate Process Document is complete and includes most limiting flowgate, and dynamic flowgate creation.	<b>Complete</b>
3.2.17	Specific Conditions Applicable to Most Limiting Flowgate	MISO and PJM should continue with the review of M2M activities during weekly coordination discussions.	Weekly coordination calls on-going.	<b>Complete</b>
3.2.18	After-the-Fact Review	MISO and PJM should continue with the weekly coordination discussions.	Weekly coordination calls on-going.	<b>Complete</b>

## 3.2 Discussion

### 3.2.1 Documentation

#### *3.2.1.1 2014 Biennial Report Recommendation:*

The recommendation coming from the latest report directs MISO and PJM to continue discussions on the following joint documents:

- Outage Coordination Procedure
- Dynamic Flowgate procedure
- M2M Flowgate Process Document
- Less-than-Optimal Dispatch procedure
- Flowgate Determination guides

#### *3.2.1.2 MISO and PJM Joint Response and Changes:*

MISO and PJM have identified a set of major documents that guide processes and procedures for the M2M process. These include:

##### **Completed Documents**

Data Exchange  
After-the-Fact Review Procedure  
Change Management Document  
Less-than-Optimal Dispatch procedure  
Flowgate Ownership Document  
Flowgate Determination Guides  
Generator Binding Thresholds  
Dynamic Flowgate procedure (Appendix 6.1)  
Flowgate Process Document (Appendix 6.3)

##### **Ongoing (Under Development)**

Market Flow Methodology Document  
DA M2M FFE Exchange Document  
Outage Coordination Procedure  
Michigan-Ontario PARS Document

With improved coordination and incremental changes, additional documents may be identified as needed. MISO and PJM continue to work together to identify new documents as well as to update existing documents to reflect the new changes.

MISO and PJM continue discussions on the following joint documents:

- DA M2M FFE Exchange Document
- Michigan-Ontario PARS Document

A joint procedural document has been created by MISO and PJM that encompasses the M2M Flowgate Process Document recommendation, and Flowgate Determination guides recommendation. Additionally, a Dynamic Flowgate Procedure, the Beaver Channel Transmittal Letter, and Outage Coordination Procedure have been addressed, written, and approved by both parties.

### **3.2.1.3 Future action items:**

In addition to the DA M2M FFE Exchange Document, Market Flow Methodology Document, and the Michigan-Ontario PARS Document, MISO and PJM will continue to enhance documentation and process guides as needed.

## **3.2.2 Modeling**

### **3.2.2.1 2014 Biennial Report Recommendation:**

MISO and PJM will review the current exchange of quarterly EMS model information and develop/implement improved coordination processes. Changes/improvements to these processes will be provided via each RTO's stakeholder reporting process.

### **3.2.2.2 MISO and PJM joint response and changes:**

Documentation has been developed for identifying the model changes that impact the Market to Market (M2M) flowgates in order to ensure the model changes are appropriately added in each other models. MISO and PJM are coordinating and reviewing the model changes before each RTO's quarterly model updates.

### **3.2.2.3 Future action items:**

Initial scope of the modeling coordination has been completed. No future action is recommended. MISO and PJM will continue coordination and make changes as needed.

## **3.2.3 Data Exchange**

### **3.2.3.1 2014 Biennial Report Recommendation:**

MISO and PJM are targeting to add the interim Flowgate allocation data and interim Market Flow calculator data to the data exchange by the end of 2014.

### **3.2.3.2 MISO and PJM joint response and changes:**

MISO and PJM have documented their market flow methodologies such that exchanging intermediate data is no longer necessary.

### **3.2.3.3 Future action items:**

MISO and PJM do not believe future action is needed for this topic. MISO and PJM will continue to make enhancements to data exchange as needed.

## **3.2.4 Outage Coordination**

### **3.2.4.1 2014 Biennial Report Recommendation:**

Continue with MISO/PJM JCM Initiatives.

### **3.2.4.2 MISO and PJM joint response and changes:**

Complete, with on-going monitoring. MISO and PJM provided a final update at the January 2014 JCM meeting and agreed that the enhanced coordination between FTR groups will further improve PJM's FTR funding. MISO Transmission Owners have agreed to submit planned transmission outage requests for critical facilities further in advance that will facilitate increased coordination of outage schedules amongst the RTOs and further improve funding. The RTOs have agreed to continue analysis of reasons for short-term flowgate requests and investigate ways to reduce the volume.

#### **3.2.4.3 Future action items:**

Initial scope is completed; any further scope will be addressed through the JCM process.

### **3.2.5 Change Management**

#### **3.2.5.1 2014 Biennial Report Recommendation:**

MISO and PJM should continue to utilize the change management process.

#### **3.2.5.2 MISO and PJM joint response and changes:**

MISO and PJM have established the Change Management process detailed above in section 2 to provide better transparency and management of M2M coordination. Any changes in one RTO's practices that may directly affect M2M coordination and/or settlement, is subject to approval of the counterparty RTO. Several items have been approved via this new process, and those are detailed in section 2 above.

The change management log has been posted on the website link for both MISO and PJM:

MISO: <https://www.misoenergy.org/Library/Pages/ManagedFileSet.aspx?SetId=1256>

PJM: <http://www.pjm.com/markets-and-operations/energy/market-to-market.aspx>

The change management process is working process and has helped both parties ensure they are aware of changes occurring in each other's systems.

#### **3.2.5.3 Future action items:**

No immediate action items. MISO and PJM should continue to utilize the change management process that has been established.

### **3.2.7 Flowgate Determination**

#### **3.2.7.1 2014 Biennial Report Recommendation:**

The parties are currently developing a Flowgate creation procedure document for real-time M2M Flowgates whose qualifying coordination tests cannot be run prior to the need date for the Flowgate. The parties are targeting a 2014 completion date for this procedure.

#### **3.2.7.2 MISO and PJM joint response and changes:**

The Flowgate Process Guide satisfies this topic. The guide is a joint document between MISO and

PJM that provides a procedure for flowgate creation. A summary of this guide is detailed in appendix A. Additionally, MISO and PJM agreed to use 35% market flow threshold for 138 kV or below facilities. Enhancements made to ensure flowgate tests are performed in timely manner. PJM and MISO have each followed this procedure since its inception.

#### ***3.2.7.3 Future action items:***

The procedure is complete, and there are no further action items.

### **3.2.8 Real Time Market Flow Determination**

#### ***3.2.8.1 2014 Biennial Report Recommendation:***

MISO and PJM will finalize the Market Flow Calculation methodology document as covered in section 3.2.1.2.

#### ***3.2.8.2 MISO and PJM joint response and changes:***

A Market Flow Calculation methodology document has been created, noting the high level methodologies used to calculate market flow for each party. The document focuses on the general steps to calculate market flow that both parties adhere to, as well as special cases that exist for each party. MISO and PJM are working to complete a document for public release.

#### ***3.2.8.3 Future action items:***

Complete document for public release and continue to enhance documentation as necessary.

### **3.2.10 M2M Coordination**

#### ***3.2.10.1 2014 Biennial Report Recommendation:***

MISO and PJM should continue to work together to finalize the M2M Flowgate Process document and the procedure for dynamic flowgate creation.

#### ***3.2.10.2 MISO and PJM joint response and changes:***

MISO and PJM worked on the M2M coordination and finalized the M2M Flowgate Process document and the procedure for dynamic flowgate creation.

#### ***3.2.10.3 Future action items:***

MISO and PJM do not believe future action is needed for this topic.

### **3.2.11 Day-Ahead Energy Market Coordination**

#### ***3.2.11.1 2014 Biennial Report Recommendation:***

Revisit the JOA language regarding FFE sharing provisions. The two parties have been jointly working through the MISO/PJM JCM Initiative to develop a process that will allow this provision to be utilized through a coordinated study. MISO and PJM should continue to work towards their Q1 2016 completion date for the effort.

### ***3.2.11.2 MISO and PJM joint response and changes:***

MISO and PJM have developed a document to include guidelines for M2M flowgate identification. Pending FERC approval, PJM and MISO are targeting an implementation by Q1 2016.

### ***3.2.11.3 Future action items:***

Follow through with implementation upon FERC approval.

## **3.2.12 Purpose of Market to Market**

### ***3.2.12.1 2014 Biennial Report Recommendation:***

MISO and PJM should continue to work together to finalize the M2M Flowgate Process document and the procedure for dynamic flowgate creation.

### ***3.2.12.2 MISO and PJM joint response and changes:***

A dynamic flowgate creation procedure has been created and M2M Flowgate Process document has been created. While the dynamic flowgate creation procedure is a specific procedure, the Flowgate Process document covers a wider set of circumstances for flowgate creation, and details these processes with the purpose of market to market in mind.

### ***3.2.12.3 Future action items:***

Original documents have been created and MISO/PJM will continue to enhance documents as necessary.

## **3.2.15 Most Limiting Flowgate**

### ***3.2.15.1 2014 Biennial Report Recommendation:***

MISO and PJM should continue to work together to finalize the M2M Flowgate Process document and the procedure for dynamic flowgate creation.

### ***3.2.15.2 MISO and PJM joint response and changes:***

A dynamic flowgate creation procedure has been created and M2M Flowgate Process document has been created. While the dynamic flowgate creation procedure is a specific procedure, the Flowgate Process document covers a wider set of circumstances for flowgate creation that includes the details of using the most limiting flowgate to manage congestion.

### ***3.2.15.3 Future action items:***

Original documents have been created and MISO/PJM will continue to enhance documents as necessary.

## **3.2.16 Substitute Flowgate**

### ***3.2.16.1 2014 Biennial Report Recommendation:***

MISO and PJM will continue to work together to finalize the M2M Flowgate Process document.

***3.2.16.2 MISO and PJM joint response and changes:***

An M2M Flowgate process document has been created that includes the reasoning and procedure to use a substitute flowgate.

***3.2.16.3 Future action items:***

Original documents have been created and MISO/PJM will continue to enhance documents as necessary.

## 4. FERC Filings

This section includes FERC filings that directly impacts MISO-PJM Market-to-Market process.

### 4.1. Summary

FERC Order	Description	Status
ER14-2367-000	PJM proposed revisions to section 3.3 of Attachment 5 of the MISO-PJM JOA. The change was to address, 1. New charges assessed to MISO for exceeding 1,000 MW path limit during emergency energy to PJM and 2. New charges assessed to PJM or MISO for similar situations in the future.	Effective July 7, 2014
ER14-2358-000 & ER14-2359-000	<ol style="list-style-type: none"> <li>1. Changes to the PJM mailing address in tariffs, OA and JOA.</li> <li>2. Updates and/or deleting contact information for specified PJM officers</li> <li>3. Section 1.5 of Schedule 11 to update "Schedule" to "Section"</li> </ol>	Effective September 2, 2014
ER14-1405-000	MISO, SPP and PJM agree that a consistent methodology be applied by each RTO for the following calculations: 1. Market flow 2. Firm flow entitlements 3. Firm flow limits 4. Transactions impacts within the Interchange Distribution Calculator.	Effective June 1, 2014
ER15-994-001	MISO and PJM agree that the threshold test percentage criteria for "Total Flow Market-to-Market Flowgates", as specified in the Interregional Coordination Process (ICP) section 1.1.3, needs to be enhanced for single monitored element Flowgates at voltages of 138kV or lower	Effective August 4, 2015

## 4.2. Discussion

Each of the orders listed above were initiated to ensure consistency in the calculation between both RTO's.

### ER14-2367-000

FERC Order ER14-2367-000 is requesting changes to the Section 3.3 of Attachment 5 of the Joint Operating Agreement between MISO and PJM. The filing will allow the following: 1. MISO to recover costs invoiced to MISO as a transmission customer under the SPP service agreement filed in Docket No. ER14-1174-000 in the event that MISO market flows exceed the existing contract path capacity of 1,000 MW between MISO Midwest region and the MISO South region in order to provide emergency energy assistance to PJM and 2. MISO or PJM to recover costs for any similar situation that may arise for either party in the future.

### ER14-2358-000 and ER14-2359-000

FERC Orders ER14-2358-000 and ER14-2359-00 changes the PJM mailing address in Tariffs, OA, and JOA for OATT attachments. The filing can and be reviewed to see all redlined and impacted sections.

### EL14-1405-000

FERC Order EL14-1405-000 established a methodology that requires consistency in performing calculations for Market flow, FFE , FFL, and transaction impacts within IDC for SPP, MISO and PJM therefore ensuring consistent treatment in the existing CMPs. MISO and PJM have chosen to use the methodology of Marginal Zones while SPP has elected to continue using the POR/POD methodology.

### ER15-994-001

FERC order ER15-994-001 required MISO and PJM to maintain 25% threshold criteria for single monitored element Total Flow Market-to-Market Flowgates at voltages higher than 138kV and to adopt 35% threshold test criteria for single monitored element Total Flow Market-to-Market Flowgates at voltages of 138kV or lower. This change was reflected in the JOA Interregional Coordination Agreement section 1.1.3.

## 5. Summary

MISO and PJM have completed our second biennial review per docket EL10-45-000, documenting the progress made from the initial recommendations stemming from the baseline review. In the past two years, most of the initial recommendations have been implemented. Additionally, more are in active discussion, and both parties continue to work towards completing all of the suggested improvements. Beyond this, MISO and PJM continue to strive in communication excellence and full compliance of their Joint Market Agreement. In dedication to this agreement, PJM and MISO have utilized weekly coordination calls to address any weekly coordination issues, as well as bi-weekly calls that address high-priority items and longer term planning.

MISO and PJM are working towards implementing significant ideas and improvements recommended through the Joint and Common Market (JCM) efforts to enhance the Market to Market process:

- a. Enhanced Forward Market Coordination for Day Ahead and FTR
- b. Michigan Ontario PAR Modeling
- c. Coordinated Transaction Scheduling
- d. Capacity Deliverability
- e. Cross-border Transmission Planning

In addition to these improvements, PJM and MISO will continue to discuss future and ongoing JCM efforts including, but not limited to:

- 1) Interface Pricing
- 2) Freeze Date
- 3) Pseudo Tie Modeling

MISO and PJM have worked diligently in addressing and implementing the recommendations outset in the Baseline Review. We are targeting all the pending recommendations by next biennial review. As more opportunities for improvement exist, both parties are committed to improving their adherence to the JOA agreement through an evolving and enhanced communication process.

## 6. Appendix

### 6.1 MISO-PJM Dynamic Flowgate Creation Procedure Overview

#### **Background:**

Per MISO-PJM JOA (Attachment 2 Interregional Coordination Process) it requires both parties to establish a process to activate a constraint in M2M real time coordination, before the M2M qualification test can be completed.

*“1.2.1 MISO and PJM will implement a process whereby either RTO may request the other to enter an anticipated M2M Flowgate into the dispatch tools before the completion of the Flowgate studies when a system event requires prompt attention. Binding on the Flowgate may commence as soon as each entity’s operators can make the monitored/contingent element pair available in its system. ”*

Currently, standard M2M qualification test (CMP coordination test, 25%/35% market flow test) could take from hours up to a few days to be completed. As result, the new process benefits the real time operations with expedited M2M flowgate coordination. MISO and PJM have been working together to establish the process, mainly to address the needs of new constraints that identified in real time due to unexpected system operation conditions such as forced outages.

#### **Procedure Overview:**

1. Real Time Coordination
  - a. Process of RTO’s real time communications on flowgate request, including the after hour contact if the flowgate is requested outside working hours.
  - b. Each RTO’s procedure to activate the constraint in processes (Market Flow, JOA, EMS) needed for real time M2M coordination.
  - c. It is expected the flowgate will be able to enter into real time M2M within four (4) hours from the time requested.
2. After the Fact Review Process
  - a. Process for M2M test on the constraint, after the flowgate is activated in real time M2M.
  - b. Procedure of termination of M2M, if the later result shows the flowgate fails the M2M coordination test.
3. Settlement Process
  - a. Non-Monitoring RTO (NMRTO) held harmless settlement process, if the flowgate fails the M2M coordination test.
  - b. FFE recalculation process, if the FFE is not available for periods of real time M2M coordination.

## 6.2 Model Coordination between MISO/PJM – Flowgate Changes

### **Background:**

MISO and PJM perform EMS network Model updates each quarter. This document is intended to provide details of model coordination between MISO and PJM related to modeling changes that may impact the Market to Market (M2M) flowgates and Reciprocally Coordinated Flowgates.

### **Procedure Overview:**

1. When changes are identified for next model update, each RTO will verify if the upcoming changes will impact existing flowgates' definitions. Modeling teams will work with flowgate keepers in verifying the model changes to identify new substations that may impact the flowgate definitions, e.g. new taps in between two buses that define the existing flowgate. In case there are any flowgates being impacted due to model changes flowgate keepers at each RTO will communicate and coordinate the changes as needed with partner RTO at least 4 weeks prior to production cutover, upon release of preliminary models.
2. RTOs may also use double modeling to model future equipment in order to account for equipments that come in service between the model updates. PJM double models per the established process/requirement in modeling updates 6-12 months before the known cut-in date. If flowgate is identified as being affected by the double modeling, flowgate keepers will send the information to partner RTO. RTOs will coordinate changes to flowgate definition timing based on the confirmation of new equipment in service date.
3. Each RTO will provide a list of changes implemented at its EMS model, for upgrades in the partner RTO's system. The partner RTO will review the list of changes, and provide comments on whether the list of changes is sufficient for EMS model to be used in M2M. If necessary, additional changes may be suggested by M2M staff to be included in the next EMS model update, to ensure accuracy of price signal on M2M constraint on or close to the new facilities. This review is expected to be completed at least 3 weeks before the production model update.

## 6.3 Flowgate Process Document Overview

This document was created to address a number of recommendations made in the initial Biennial Review. The purpose of the document was to not only implement the recommendations, but to provide a thorough background on the purpose of M2M for both parties, and provide a reference for both parties to utilize for many of the processes and procedures that exist in this function. A list of topics includes:

- I. A background on M2M that includes defining key terms and flowgate types
- II. A procedural overview of the processes that surround flowgates
  - a. Overload Identification
  - b. Adding Flowgates to the appropriate information systems
  - c. Removal of flowgates
- III. Dynamic Flowgate Creation
- IV. Model updates
- V. Timing of coordination studies and model updates
- VI. Communication
  - a. Coordination Requests
  - b. Emergency Contacts
  - c. Periodic conference calls