

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

Reliability Technical Conference )  
Docket No. AD19-13-000 )  
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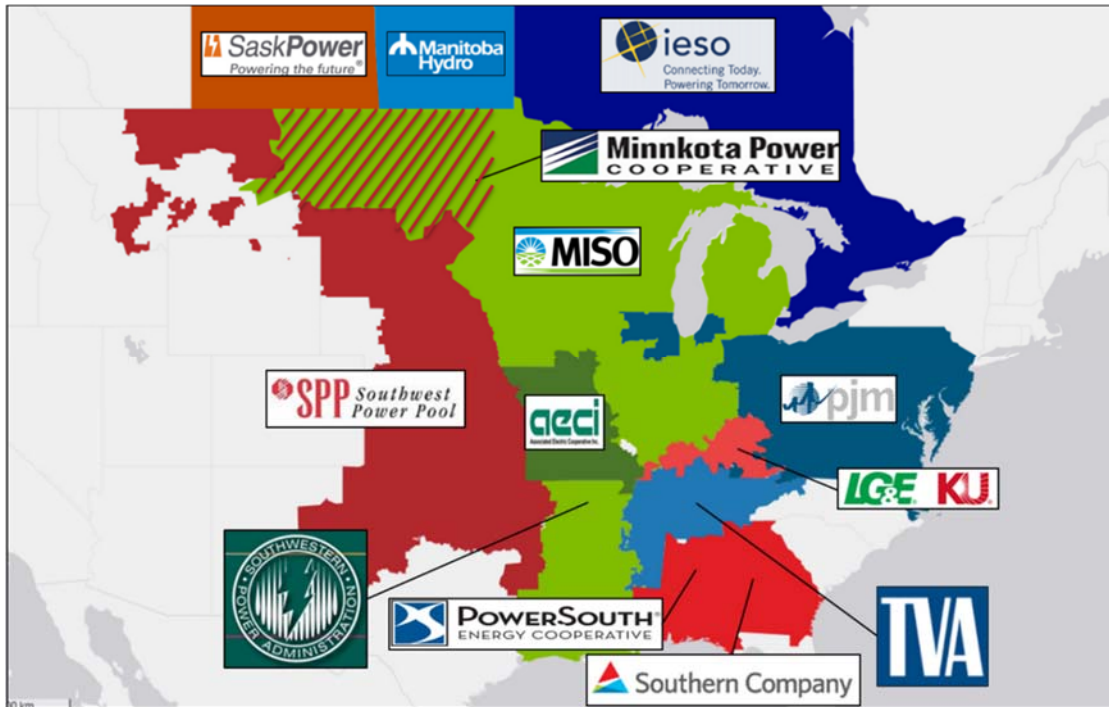
**PREPARED REMARKS OF MELISSA SEYMOUR  
ON BEHALF OF  
THE MIDCONTINENT INDEPENDENT SYSTEM OPERATOR, INC.**

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The Midcontinent Independent System Operator, Inc. (“MISO”) appreciates the opportunity to participate in this Reliability Technical Conference and discuss reliability issues associated with seams. My name is Melissa Seymour and I am the Executive Director of Central Region Member Relations and Seams Coordination for MISO. I lead a team that focuses on the development of MISO’s seams policy and the ongoing coordination with neighboring transmission system operators. The discussion in this fourth panel is quite timely given MISO’s increased coordination with its neighbors during emergency events and the lessons learned we can share with the West as they embark on establishing joint Reliability Coordinator (“RC”) processes for their new seams.

## **I. Introduction**

Given the historic service territories of the electric industry, borders between neighboring utilities have always existed and have to be managed. The consolidation of numerous local balancing authorities into Regional Transmission Organizations (“RTOs”) created more expansive borders along those regions. While seams, and the issues associated with them, were not created with regional, organized electric markets, the challenges in managing the interconnected system along borders increased. Recognizing this potential, the Federal Energy Regulatory Commission (“Commission”) directed the creation of Joint Operating Agreements (“JOAs”) between neighboring entities to address and minimize issues related to reliability, efficiency and equity at the same time as the Commission outlined general requirements for RTO development. As illustrated in the map below, MISO currently shares borders with a diverse set of entities that can have differing operating responsibilities, regulatory structures, operating practices, planning assumptions, etc. that make each region or entity unique.



PJM Interconnection, L.L.C. (“PJM”) and MISO were the first RTOs to enter into a Commission-approved JOA in 2004. When MISO launched its markets, the Commission encouraged MISO and PJM to develop a joint and common market covering the two regions. This push has led MISO and PJM to have mature processes to minimize the impact of the seam on the two markets. In 2004, when Southwest Power Pool (“SPP”) applied to FERC for regional transmission organization status, the Commission conditioned its approval on SPP entering into a seams agreement with MISO. MISO and SPP originally executed the JOA with a Congestion Management Protocol on December 1, 2004. While originally implemented as a MISO market to SPP non-market seams agreement, the MISO-SPP JOA has been revised numerous times as the MISO and SPP markets have evolved to become, in 2015, the market-to-market seams agreement in place today.

In addition to the JOAs between MISO and PJM and SPP, MISO has varying types of procedures and agreements with a number of its neighbors to govern coordination with those entities, as summarized by the following table. These agreements are necessary to provide additional procedures to complement North American Electric Reliability Corporation (“NERC”) Reliability Standards.

	PJM	SPP	AECI	TVA	LGE & KU	South-ern Co.	Power-South	MPC	Mani-toba Hydro	IESO	Sask-Power
Reliability and/or Balancing Authority Coordination	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Order 1000 Interregional Coordination and Cost Allocation	✓	✓	✓ <sup>2</sup>	✓ <sup>2</sup>	✓ <sup>2</sup>	✓ <sup>2</sup>	✓ <sup>2</sup>				
Congestion Management Process	✓	✓	✓ <sup>1</sup>	✓ <sup>1</sup>	✓ <sup>1</sup>			✓	✓		
Market-to-Market	✓	✓									
Contract Path Capacity Sharing	✓	? <sup>3</sup>									
Zero through-and-out transmission rate	✓ <sup>4</sup>										
Targeted Market Efficiency Projects	✓										

1 - AECI, LGE/KU, and TVA applicable to MISO as reciprocal entity through the MISO-PJM JOA.  
2 - As part of the Southeastern Regional Transmission Planning (SERTP) Order 1000 regional transmission planning group.  
3 - Parties will negotiate compensation if a Party exceeds or anticipates that it will exceed its own contract path during normal operations due to a change in RTO membership.  
4 - Drive-Outs from MISO to PJM are charged for Multi-Value Projects through Schedule 28-A.

As reserve margins decline and new resources look to connect to our systems, it is crucial that we collectively ensure that seams protocols allow for the optimization of resources broadly to the benefit of end-use consumers. To that end, there are two primary seams efforts MISO believes would improve reliability and bring additional value to consumers by making seams more “seamless”:

- (1) Enhance Commonalities – commonalities should be expanded and enhanced, such as common definitions of emergencies, common expectations for providing relief to transmission systems, and common coordination for planning and expectation of generation and transmission outages.
- (2) Maximize the Use of Existing Bulk Electric System – increase efficiencies of using existing system investments (both transmission and generation) to increase reliability or improve cost effectiveness to end use customers.

## **II. Enhanced Commonalities.**

As part of NERC requirements, there is significant coordination between Reliability Coordinators at the seam that minimize the risk of reliability issues. However, MISO and its seams partners have taken additional steps to establish commonalities that further enhance reliability in areas such as outage coordination, market to market processes, and communications protocols. Below I discuss examples of existing commonalities that enhance reliability and improve cost effectiveness. Thereafter, I discuss areas where use of commonalities could produce efficiencies and benefits for consumers.

### **A. Existing Commonalities**

#### *1. Outage Coordination*

One example of an enhanced commonality between MISO and its seams partners is an improved interregional outage coordination process for transmission and generation outages to ensure reliability and to promote optimal, efficient market operations. MISO, along with a number of neighboring entities including, but not limited to, Southern Company, Tennessee Valley Authority, SPP, PJM, Independent Electricity System Operator (Ontario), ISO New England,

Hydro Quebec, and New York ISO, participate in this improved coordination process. We believe these entities have had a positive experience implementing the outage coordination process. As part of the process, MISO and its neighbors analyze planned critical facility maintenance to determine its effects on the reliability of the transmission system. Each entity's respective analysis of generation and transmission outages consider the impact of its critical outages on the reliability of the other entity's system.

Frequent communication between MISO and its neighbors plays a significant role in the outage coordination process. On a weekly basis, or daily if requested by one of the entities or an outage issue is identified, the operations planning staff of each entity jointly discuss any anticipated outages to identify potential impacts. These discussions include either concurrence with the anticipated outage or identification of significant impacts due to the anticipated outage. MISO and its neighbors also notify each other of emergency maintenance and forced outages as soon as possible after these conditions are known. Each entity will evaluate the impact of emergency and forced outages on their respective transmission systems and work with one another and affected Transmission Operators or Generator Operators to develop remedial actions as necessary.

In addition to frequent communication, outage schedule changes, both before or after the work has started, may require additional review. Each entity will consider the impact of outage schedule changes on the other neighbor's system reliability, in addition to its own system. MISO and its neighbors will contact each other as soon as possible if these changes result in unacceptable system conditions and will work with one another to address these conditions as necessary.

## *2. Interregional Coordination Process*

Another enhanced commonality between MISO and PJM, as well as MISO and SPP, is the Interregional Coordination Process (also commonly referred to as "market-to-market

coordination” or “M2M” coordination). Market-to-market coordination procedures are utilized by the RTOs to manage congestion along the seam on flowgates upon which both RTOs have a material impact. The market-to-market coordination procedures are included in the respective JOAs between MISO and PJM and MISO and SPP.

M2M builds on the Congestion Management Process (“CMP”), by adapting the coordination provisions of the CMP for use by SPP and MISO or PJM and MISO to jointly dispatch their respective energy markets to manage congestion on Reciprocal Coordinated Flowgates (“RCFs”). The fundamental philosophy of market-to-market coordination is to maximize the use of the transmission system and allow any RCFs significantly impacted by generation dispatch changes in both markets to be jointly managed in the security-constrained economic dispatch models of the RTOs. M2M provides the RTOs a common set of criteria and rules for implementation of the processes, common practices for transmission related relief, and common, established practices for settling the relief provided. In addition, jointly managing transmission constraints near the MISO-PJM and MISO-SPP seams provides a more efficient, cost effective, and responsive congestion management tool than the traditional Transmission Loading Relief (“TLR”)-based congestion management regime, under which distribution of congestion management across a broader area of the system has proven to be less reliable, more disruptive, and more costly. The chart below further illustrates the differences between TLR and the M2M.

	TLR	M2M
<b>Relief Calculation Granularity</b>	Hourly	5 minute

<b>Relief Source</b>	Cuts lowest priority schedule	Redispatch of lowest cost generation
<b>Data Quality</b>	Static (except for market's reporting real-time market flow)	Real-time, sub-second
<b>Usage</b>	RC discretion	Upon constraint activation in market
<b>Settlement</b>	None	Based on Firm Flow Entitlement (FFE) usage
<b>Regulation</b>	NERC ORC / NAESB	JOA (FERC)

B. Future potential areas where use of commonalities can produce efficiencies and benefits for consumers

MISO sees areas that would benefit from use of enhanced commonalities. Three of those areas are emergency criteria, understanding Transmission Line Ratings, and Affected System Coordination.

1. *Emergency Criteria*

One area of improvement between neighboring Reliability Coordinators is having common industry definitions of the different types and levels of emergency conditions. This need was highlighted by an event that began on January 17, 2018, when record cold in the MISO drove significantly higher load than normal for January. MISO South region peak load on January 17<sup>th</sup> was only 2% lower than the region's all-time peak set in August 2015. Operating conditions were further complicated by a significant number of unplanned generator outages and de-rates in real



time. MISO worked with its neighbors to ensure we were all able to “keep the lights on” for our load.

MISO, SPP, Tennessee Valley Authority, and Southeastern Reliability Coordinators have met on several occasions to review the event that occurred on January 17, 2018, discuss lessons learned, and discuss potential coordination enhancements. In these discussions, a lack of common emergency procedures and a lack of understanding of each other’s systems increased the challenges faced during that event. In particular, while all parties may have been using the same or similar words, many terms have different meanings to individual entities. All parties discussed gaining a better understanding of each other’s emergency procedures to improve communications around system conditions and potential coordination enhancements.

Each Reliability Coordinator may have different criteria for declaring an emergency and when to request assistance from neighbors. For example, MISO has Capacity Advisories, Maximum Generation and Weather Alerts, as well as Maximum Generation Emergency Events. Each event or alert type triggers varying responsibilities from MISO members and resources, including Load Modifying Resources and Emergency Demand Response resources. MISO’s neighbors do not use the same terminology or necessarily have the same resource types deployed at the same emergency level. Reliability Coordinators need a common understanding of each other’s processes, not necessarily a single standard process. For this, transparency and visibility into each other’s emergency processes and procedures is vital.

## *2. Understanding of Transmission Line Ratings*

MISO has experienced different methodologies used by Transmission Operators (“TOPs”) across the seams to establish emergency line ratings. For example, some TOPs have only two ratings sets, i.e., summer and winter, while other TOPs use four ratings representing each season.

In addition, some TOPs differentiate ratings sets by temperature, thereby having a dynamic rating that changes multiple times a day. Additionally, rating methodologies utilize different time ranges in setting the normal, emergency, and load shed ratings.

The examples above illustrate why it can be difficult to get neighboring TOPs on the same page when discussing line ratings, especially when TOPs are on opposite sides of the seams. However, when there is a disagreement between RC's on a transmission line rating, the RC's are always required to operate to the most conservative rating while they work out the disagreement. Efforts should be made to reduce or eliminate these disagreements through: (1) greater transparency into the TOP's rating methodology; and (2) greater clarity of what a TOP's rating represents. The need for greater transparency and clarity can be illustrated in the following example – consider a situation when an RC is managing congestion on a facility that requires relief from a neighboring RC. The managing RC is implementing a joint congestion management process to control loading on the facility to a control limit that is below the actual emergency rating on the facility. For the neighboring RC to provide the requested relief, the neighboring RC needs to enter an emergency condition. Under these circumstances, is it acceptable for a neighboring RC to enter an emergency condition when the congestion on the system is not above or approaching an emergency rating? The neighboring RC may implement that emergency condition without further evaluating the condition with the managing RC because they did not know the rating being used represented a control limit instead of an actual emergency rating.

MISO does not suggest that each TOP have a common methodology as the physical characteristics of each TOPs' region can vary significantly, as well as the Transmission Owner's risk profile. However, having an understanding of transmission line ratings ahead of time would improve MISO and other RCs' ability to coordinate effectively and reduce the time to resolve

potential disagreements. This is important as transmission line ratings can determine when an RC declares an emergency state and, therefore, more conservative ratings may trigger emergency declarations sooner.

### 3. *Affected System Coordination*

The interconnection of new generation resources is another area where increased commonality or understanding would minimize seams impacts. In Order No. 2003, the Commission required transmission providers to coordinate interconnection studies and planning meetings with Affected Systems.<sup>1</sup> MISO, SPP, and PJM's tariffs require the host RTO to coordinate with neighboring RTOs that are Affected Systems. As the Commission is aware through other proceedings,<sup>2</sup> Affected System coordination is extremely complex given each RTO has a unique interconnection queue process with distinct timing requirements. Increased understanding between neighbors of each other's interconnection processes and requirements can help each RTO or transmission provider guide its interconnection customers through these complex Affected System processes. This improved understanding should include: (1) the timing of RTOs to complete Affected Systems analyses; (2) the standard the Affected System applies to determine impacts from proposed generation interconnecting in the host RTO; and (3) how network upgrade costs are assigned between the proposed generation connecting to the host RTO versus the Affected System.

## **III. Maximizing the Use of Existing Systems**

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<sup>1</sup> An "Affected System" is defined in MISO's Tariff as an electric transmission or distribution system or the electric system associated with an Existing Generating Facility or of a higher queued Generating Facility, which is an electric system other than the Transmission Owner's Transmission System that is affected by the Interconnection Request.

<sup>2</sup> See Docket Nos. AD18-8-000 and EL18-26-000.

Consistent with principles underlying the Commission’s efforts to establish a joint and common market between RTOs in the Eastern Interconnect, it is crucial that Reliability Coordinators (and the Commission) focus on maximizing the use of existing transmission and generation resources. The inefficient use of existing investment can result in increased costs to end-use customers and diminished reliability. Inefficiencies existing today are largely the result of operating under separate tariffs with different operating and transmission planning procedures that have been driven by differing philosophies on the use and operation of the transmission system. These inefficiencies are difficult to fix as each region (MISO included) prefers their own processes over those used by others. While regional differences can add value to each region, they can drive inefficiencies as long as there are seams.

In MISO’s experience, its seam with PJM is the most efficient at maximizing existing assets. This is in part due to a shared understanding of JOA provisions and processes that help optimize efficiency across the seam. In particular, MISO and PJM’s understanding that the capacity sharing provisions of the JOA<sup>3</sup> mutually benefit customers in both RTOs maximizes existing assets and improves reliability. In particular, MISO and PJM’s practices maximize the use of the transmission system for all parties by allowing for reciprocal use until congestion occurs and then the parties manage that congestion together through M2M and compensate each other based on their allocation determined through historic use.

For example, by having access to MISO-PJM JOA Section 6.5, MISO and PJM are able to fully use the combined transmission system (resources under the functional control of either RTO)

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<sup>3</sup> See Section 6.5 of the MISO-PJM JOA: “**Sharing Contract Path Capacity.** If the Parties have contract paths to the same entity, the combined contract path capacity will be made available for use by both Parties. This will not create new contract paths for either Party that did not previously exist. PJM will not be able to deal directly with companies with which it does not physically or contractually interconnect and MISO will not be able to deal directly with companies with which it does not physically or contractually interconnect.”

to ensure loads are served during times when either RTO has an outage that might otherwise “island” either the load being served or the generation serving them. The Commission’s policy to drive down barriers to trade across RTO seams is complemented by sharing unused transmission capacity, providing more efficient use of transmission at a lower cost, and reducing ultimate energy costs to consumers.

As mentioned earlier, philosophical differences in how RCs choose to operate their transmission system can create inefficiencies at the seam. Some entities have fully embraced markets and the maximization of the use of the transmission system, while other entities take a more historic approach for transmission service. The differences can also result in Transmission Owners in the various regions being treated differently on different seams.

An analogy can be found in our highway system. In particular, some interstates are viewed as a sunk cost, e.g., while taxpayers in Indiana may have paid for I-70, travelers from any state can drive across it at any time for no cost. In contrast, other interstates are toll roads; although the interstate was paid for by one constituency, anyone who drives across that highway pays a toll. MISO believes that the “sunk cost” (or capacity sharing) approach is the most reliable and provides the most benefit to end-use customers. Not only does it maximize efficiency and the use of existing resources, it allows operators to focus on handling issues and emergencies, rather than trying to track down who drove on that particular road during an emergency and ensuring they pay their toll. The Commission should encourage Reliability Coordinators to maximize the use of the interconnected transmission system by allowing for the use of all available transmission to provide a more cost-effective and reliable delivery of energy to end-use customers.