

RTO Market Monitors Scoping Plan for OMS/RSC Seams Liaison Committee

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INTRODUCTION

This scoping plan is presented to the OMS/RSC Seams Liaison Committee¹ by the respective Monitors² for MISO and SPP in their continuing effort to identify and study seams issues, and where possible to quantify costs and benefits of proposed solutions. This scoping plan describes the following aspects of each issue:

- Issue: Description of the issue and its effects on efficiency, reliability, or equity.
- Solution: The possible solution(s) or conceptual changes that would address the issue.
- Study Method and Results: Discusses the proposed study methodology, as well as the anticipated results of the study.
- Effort: The expected level of effort to complete the analysis of the issue without taking into account dependencies.
- Potential Next Steps: Provides an initial indication of the post-study actions toward addressing the issue.

The joint study by the monitors will modify and refine the assessments of these factors. Ultimately, we expect the study will produce a set of consensus recommendations to the RTOs and stakeholders. However, it is possible that no consensus or only partial consensus may be reached on some issues, and individual positions will be included.

Following the review and input by the Liaison Committee, we will further refine the scope and then will develop more detailed work plans³ for each selected issue. The initial set of candidate issues include:

- 1) Market-to-Market Coordination
- 2) Targeted Market Efficiency Projects
- 3) Interface Pricing
- 4) Interchange Optimization
- 5) Regional Directional Transfer Limit
- 6) Outage and Day-Ahead Coordination
- 7) Rate Pancaking
- 8) Joint Dispatch

The monitors expect that a subset of these issues can all be evaluated consistent with the described study methods in the next 6-8 months. The effort levels for analyzing each issue are estimated as “Low”, “Medium”, and “High”. These estimates are relative to effort levels of each issue. Some of these estimates are uncertain at this point and can be better assessed as we develop the work plan. However, we have confidence that the Low and Medium effort issues can be adequately evaluated in the timeframe of the study.

¹ Organization of MISO States (OMS) and Regional State Committee (RSC).

² The internal SPP Market Monitoring Unit (MMU) and the Independent Market Monitor (IMM) for MISO.

³ To the extent RTO participation is required, the work plan will indicate RTO resources required.

Recommended Priorities by the Market Monitors

Because it is likely not feasible to study all of the issues listed, identifying the highest-value issues is important. Each of the market monitors have reviewed the candidate issues and propose the following priorities. In general, these proposed priorities are based on the expected benefits of improvements in each of these areas.

MISO IMM Recommended Priorities

Initiative	Notes
1. M2M Improvements	Some of the largest economic costs incurred in most RTO markets are the costs incurred to manage transmission congestion. A large portion of congestion in MISO and SPP is affected by resources in the others' market. Improving the M2M processes will generate large efficiency benefits.
2. & 3. Interface Optimization and Interface Pricing	These two issues are related and both would improve the economic interchange of power between MISO and SPP. Improved scheduling will generate significant benefits by allowing lower cost resources in one region to displace higher-cost resources in the other.
4. Outage and Day-Ahead Coordination	The area includes a number of issues and the benefits are uncertain. MISO and SPP both have limited authority to coordinate outages economically. While increased authority would produce cross-market benefits, it would produce much larger benefits internally for each RTO, but neither has chosen to pursue expanded outage coordination authority.
5. Regional Directional Transfer Limit	Decreasing the commitment and dispatch effects of the RDT would produce benefits because the RDT impedes efficient transfers between the MISO regions. This solution would also result in higher, more equitable payments to the joint parties.
6. Targeted Market Efficiency Projects	We do not rank this as highly as the SPP MMU because we believe it would primarily shift the allocation of costs for transmission upgrades. However, if it results in additional transmission upgrades being implemented, the benefits would be higher.
7. Rate pancaking	Transmission rates likely have a modest effect on inter-RTO transactions given their size. We believe the effects of interface pricing improvements and coordinated transaction scheduling are much larger.
8. Joint dispatch	The results will likely be driven primarily by the assumptions and difficult to interpret. There is no potential solution that this analysis would support.

SPP MMU Recommended Priorities

Initiative	Notes
1. Targeted Market Efficiency Projects	Over time transmission development has the potential to yield the greatest benefits by alleviating congestion and improving inter-regional and intra-region transfers.
2. M2M Improvements	The SPP market monitor has tracked inefficiencies with regards to market-to-market over the last several years. Improvements to this established process can provide more immediate and tangible results.

3. Outage and Day-Ahead Coordination	The market has more flexibility and a greater set of resources to address issues day-ahead as compared to real-time. Better outage and day-ahead coordination have the potential to reduce subsequent real-time market-to-market actions.
4. Interchange Optimization	Our understanding is that coordinated transaction scheduling has had mixed results in other markets. However, it has the potential to provide meaningful benefits on the SPP-MISO seam. This study would help inform if and how to move forward with such an approach.
5. Interface Pricing	While we believe the overall impact of this change to the market is moderate, this initiative has the potential to identify an actionable solution.
6. Regional Directional Transfer Limit	While we have an opportunity to analyze potential benefits and costs to changes in the RDT, we are concerned that the effort required to study enhancements would not result in material improvements.
7. Rate pancaking	Rate pancaking is one of a number a factors that affect transfers. Identifying changes in production costs may show potential benefits but does not highlight impacts to transmission revenue. It is not clear how this analysis can translate into effective next steps.
8. Joint dispatch	We believe that it would be a significant challenge to set up the joint dispatch, particularly with regards to assumptions. Given the potential error and wide range of potential benefit estimates, it is not clear how this would be used and useful going forward.

1. Improvements in Market-to-Market Coordination – Flowgate Testing and Coordination

- a. Definition/Issue Statement:** Market-to-market coordination plays a key role in managing the network interactions between the SPP and MISO systems. However, a number of shortcomings have been identified that reduce its effectiveness and savings, including:
- i. Lack of automation on reciprocal coordinated flowgate (RCF) identification and testing.
 - ii. Incomplete and lack of timely use of software designed to allow a coordinated flowgate to be transferred from the RTO with the responsibility of monitoring the constraint to the other RTO.
 - iii. Failure to request on optimal amount of flow relief.
 - iv. The lack of coordination in the day-ahead market to exchange entitlements on key constraints so the MISO and SPP day-ahead market will produce reasonable commitments and prices for market-to-market constraints.
- b. Solution(s):** Improvement of the market-to-market coordination will likely be the result of a number of improvements to discrete portions of the market-to-market processes, including:
- i. The tools and automation to identify potential coordinated flowgates earlier in planning and operating horizons.
 - ii. The process to identify and transfer monitoring authority for a constraint to the RTO that has the most effective relief available.
 - iii. The relief request software to improve the changes in the requested relief from interval to interval.
 - iv. Procedures that have, in the past, led to the use of over-rides or transmission loading relief (TLR) rather than full coordination under market-to-market.
- c. Study Method(s) and Results:**
- i. Study: Use transmission flow, shadow prices, and other market-to-market data from SPP and MISO to estimate the historic inefficiencies (congestion values) associated with each of the issues or solutions listed above.
 - ii. Results: Summarize and discuss the congestion affected by sub-optimal market-to-market coordination, including:
 1. The total congestion affected by each market-to-market issues;
 2. The estimated reduction in congestion and production costs savings of implementing solutions to address these issues;
- d. Effort Assessment:** Medium (4 – 6 months)
- e. Potential Next Steps:** Work with RTO staff to identify software, process, and procedure changes necessary to address each of the issues identified above. Evaluate the costs and benefits of these solutions.
- f. Monitor Comments:** The SPP MMU welcomes an opportunity to analyze these issues and impacts on the SPP-MISO seam.

2. Targeted Market Efficiency Projects (TMEPs)

- a. **Definition/Issue Statement:** Without a framework to jointly analyze and identify upgrades on market-to-market constraints the true cost and benefit of upgrades cannot be assessed. The Targeted Market Efficiency Projects analysis is used on the MISO-PJM seam. It identifies historical market-to-market congestion and recommends, to each Board, projects to alleviate congestion. The study and approval processes and interregional cost allocation, is codified in the MISO-PJM Joint Operating Agreement (JOA). This type of focus on market-to-market congestion on the SPP-MISO seam is not present in the SPP-MISO JOA, leading to differing solutions and/or benefits versus cost.
- b. **Solution(s):** The 2016 Interregional Study, noted in the PJM TMEP presentation,⁴ highlighted 50 market-to-market flowgates evaluated on the MISO-PJM seam. Twenty-seven of these had projects already identified from studies other than the TMEP process; however, an additional 10 projects were recommended based on the criteria met from the TMEP analysis. A similar joint approach, that targets issues along the SPP-MISO seam, may be worth pursuing.
- c. **Study Method(s):** There are two potential approaches to studying this issue:
 - i. A qualitative approach would involve research of the TMEP analysis, and review of MISO and PJM processes, resulting in the identification of recommendations for implementation on the MISO-SPP seam that would be contentious (i.e. cost allocation); and/or
 - ii. A quantitative analysis would not recreate the substantial effort of the entire study processes in SPP and MISO (along with coordinated efforts), but would rely on existing studies that identify projects along the seams that may meet the TMEP analysis criteria which exists on the MISO-PJM seam.
- d. **Effort Assessment:**
 - i) Qualitative analysis: Low (1 – 3 months)
 - ii) Quantitative analysis: High (6 months or more)
- e. **Potential Next Steps:** Work with RTOs to highlight potential benefits of TMEP process.
- f. **Monitor Comments:** The monitors concurs on the scoping of this analysis.

⁴ PJM TMEP report can be found on the PJM website: <https://www.pjm.com/-/media/committees-groups/task-forces/mepetf/20180817/20180817-item-03-tmep-education.ashx>.

3. Interface Pricing – SPP-MISO Interface Definition

- a. **Definition/Issue Statement:** Prices must be established by both SPP and MISO at the interface to settle scheduled imports and exports with participants. One RTO will charge the participant for the export, the other will pay the participant for the corresponding import. Like all locations, the interface price includes: a system-wide energy price, a transmission loss component, and a congestion component. To calculate the congestion component, the RTO must assume where the power is going to or coming from in the external area (this is the “interface definition”). As currently implemented, both SPP and MISO include the congestion associated with jointly managed market-to-market constraints, which results in larger congestion (caused by “double counting”), and potentially larger loss payments and charges. MISO has estimated that market-to-market congestion on the SPP-MISO interface was priced at 185 percent of the actual congestion value in 2015 and 2016.
- b. **Solution(s):** The purpose of this analysis is to develop an approach to calculate accurate interface prices that entice participants to react to opportunities between markets. PJM and MISO’s attempt to address this issue by implementing a “common interface” definition has introduced new distortions and inefficiencies, which should be avoided at the SPP-MISO seam. A potential solution is for each RTO to price the congestion associated with its own constraints, assuming the power sources or sinks throughout the other RTO’s footprint. Ultimately, addressing this will result in more efficient interchange transactions.
- c. **Study Method(s) and Results:**
 - i. Study: Use market and transmission data from the two RTOs to evaluate the efficiency of the congestion pricing at the interface.
 - ii. Results: A quantitative assessment of the pricing inefficiencies and potential improvements, including:
 - 1. The extent to which the interface settlements depart from the efficient settlement for transactions over the interface.
 - 2. The total amount of “double counting” of congestion and losses.
 - 3. The extent to which the interface prices under the proposed solution would converge with efficient pricing.
- d. **Effort Level:** Low to Medium (3 – 4 months)
- e. **Potential Next Steps:** The RTOs could evaluate the feasibility, costs, and timeframe for introducing the proposed interface pricing improvement.
- f. **Monitor Comments:** Both the SPP MMU and MISO IMM concur on the scoping of this analysis. The SPP MMU is aware of the “double counting” concerns raised but has not made a statement on this matter. The SPP MMU looks forward to this opportunity to form an opinion based on this analysis.

4. Interchange Optimization

- a. **Definition/Issue Statement:** There is currently no coordinated transaction scheduling (CTS) between SPP and MISO as exists on the MISO and PJM seam. The CTS allows RTOs to clear transactions economically based on near-term interface price forecasts. Lack of a CTS limits the market's ability to efficiently schedule interchange between SPP and MISO, resulting in higher production costs in both areas.
- b. **Solutions(s):** Adoption of 5- or 15-minute Coordinated Transaction Scheduling.
- c. **Study Method(s) and Results:**
 - i. Study: Use the prices and market outcomes in both SPP and MISO to calculate the inefficiencies, as well as the potential benefits of a well-functioning CTS.
 - ii. Results:
 - 1. A summary of the estimated benefits through savings from improved or idealized interchange, in aggregate and by RTO, for a historical timeframe (i.e. the past two years).
 - 2. Summarize and discuss the existing CTS implementations, pros, cons, and lessons learned.
- d. **Effort Level:** Low to Medium (3 – 4 months)
- e. **Potential Next Steps:** Work with the RTO's to explore a potential CTS schedule process between SPP and MISO.
- f. **Monitor Comments:** Both the SPP MMU and MISO IMM concur on the scoping of this analysis.

5. Issue: Regional Directional Transfer (RDT) Limit (flows between MISO North and MISO South)

- a. Definition/Issue Statement:** RDT is a scheduling limit that addresses SPP's and the Joint Parties'⁵ reliability concerns stemming from MISO regional transfers between the MISO North Region and MISO South Region. The current RDT Limits (2,500 MW from South to North and 3,000 MW from North to South) are not based on an explicit physical limitation of the grid, and therefore limit efficient transmission utilization.
- b. Solution(s):**
 - i. Potentially have MISO procure regional operating reserves on the RDT to the extent that deploying the reserves after a contingency (i.e., flowing additional power over the RDT) will not lead to substantial congestion on neighboring systems.
 - ii. Potentially adjust the limit on the RDT dynamically, when reliability tools indicate it will not lead to reliability issues on neighboring systems.
- c. Study Method(s) and Results:**
 - i. Study: Estimate the marginal value of procuring reserves on the RDT or changing the RDT limits by using:
 - 1. Historic RDT prices and flows,
 - 2. RDT Impact Tool results that calculate the loop flow effects of the transfers, and
 - 3. Costs of commitments made to manage RDT flows.
 - ii. Results: Initial estimates of efficiency benefits gained through the improved scheduling of RDT, and resulting settlements between the Joint Parties, SPP, and MISO.
- d. Effort Level:** Low (1 – 3 months) to Medium (3 – 6 months)
- e. Potential Next Steps:** Development and description of proposed solutions, working with MISO/OMS/RSC/SPP to assess feasibility and benefits of specific solutions.
- f. Monitor Comments:** Both the SPP MMU and MISO IMM concur on the scoping of this analysis.

⁵ Associated Electric Cooperative Inc., Southern Companies, Tennessee Valley Authority, Louisville Gas & Electric/Kentucky Utilities, and PowerSouth are collectively referred to as the "Joint Parties".

6. Outage and Day-Ahead Coordination

- a. **Definition/Issue Statement:** Coordination of day-ahead and pre-day-ahead activities between RTOs remains a challenge. This includes exchange of data that impacts day-ahead and pre-day-ahead assumptions.

In addition, economic impacts are not a driver in the outage approval process relying on the RTO's authority only when reliability becomes a concern. Typical actions taken to mitigate reliability impacts (i.e. costly unit commitments, operating guides, etc.) have costly market or participant impacts.

b. **Solutions(s):**

- i. Further alignment and exchange of external assumptions used in day-ahead and pre-day-ahead activities. This could include day-ahead exchange of firm flow entitlements.
- ii. Expand authority to consider economic impacts in the review and approval of outages, as well as assignment of impacts to entities scheduling outages. New York ISO is one example of a market that has taken the approach of assigning costs to the entity that takes an outage based on the impact to congestion hedging. This leaves the entities the duty of aligning optimal times for outages.

- c. **Study Method(s):** Comparison of day-ahead market data between markets, data exchanged, and how those are used would give guidance to areas that could be improved. Also, potentially identifying overlapping outages and the benefit and cost of realigning outages as well as impact to congestion hedging.

- d. **Effort Assessment:** Medium (3 – 6 months)

- e. **Potential Next Steps:** Work with RTOs and stakeholders to develop guidelines for economic analysis of outages and assignment of costs for unapproved outages impacting congestion hedging.

- f. **Monitor Comments:** The monitors agree on the scoping of this analysis.

7. Rate Pancaking

- a. **Definition/Issue Statement:** “Rate pancaking” is the stacking or accumulation of transmission charges for service that use the transmission systems of multiple transmission providers. Both SPP and MISO offer an import service⁶ for day-ahead and real-time markets that removes some or all of the transmission charges in an attempt to remove barriers to market transactions between the two markets. Transmission charges from the exporting market still apply, and can reduce economic transactions between market areas. Other transactions between the markets that do not qualify as “import service” require transmission reservations from both RTOs and incur transmission charges from both RTOs. Rate pancaking can interfere with efficient inter-regional market activity.
- b. **Solution(s):** A methodology for discounting transmission charges across the SPP/MISO seam that is equitable for transmission owners and load, in both regions, and facilitates economic transactions between markets. This may include development of an inter-regional transmission rate and allocation methodology for transactions between markets.
- c. **Study Method(s) and Results:**
 - i. **Study:** Assess the magnitude to which rate pancaking interferes with efficient inter-regional transactions and estimate the potential benefits of reducing or eliminating those impacts by modifying transmission rates. Work with both RTOs and review assumptions and calibration of MISO’s current assessments of the potential benefits of a full or partial discount of transmission rates. Compare alternative scenarios with current state to identify impacts of rate pancaking on the efficient inter-regional market activity.
 - ii. **Results:** The results would show the current transmission costs associated with transactions between the SPP and MISO markets. The results would estimate potential changes in production costs, interchange changes, and changes to transmission rates for intra-regional activity.
- d. **Effort Level:** Medium (3 – 6 months)
- e. **Potential Next Steps:** To be determined.
- f. **Monitor Comments:** The monitors agree on the scoping of this analysis.

⁶ MISO’s import service is named “Spot-In Market product”
SPP’s import service is named “Market Import Service”

8. Joint Dispatch

- a. **Definition/Issue Statement:** RTOs plan, commit, and dispatch separately. Currently, some of the potential benefits of a joint commitment and dispatch is achieved through market-to-market coordination and interchange scheduling. However, these processes have not been optimal and the monitors have identified areas that could be improved.
- b. **Solution(s):** Analysis in this area generally supports estimates of the benefits of perfect coordination (under market-to-market and CTS) or of merging the RTOs. However, this analysis is the least directly relevant for identifying and prioritizing specific solutions.
- c. **Study Method(s) and Results:**
 - i. Study: Use a production cost model to estimate the potential/idealized production costs savings from joint commitment and dispatch of SPP and MISO. This would likely involve:
 - 1. Use MISO's production costs models that are used for assessing its value proposition (from Local Balancing Authority to RTO level commitment and dispatch) and the impacts of renewable integration.
 - 2. Working with SPP and MISO staff to develop assumptions (e.g. interchange, reserve requirements, renewable integration, etc.) and review and compare the results of various scenarios.
 - 3. Assess results using applicable historical benchmarks in an attempt to calibrate the models so that the simulated results are reasonably consistent with actual market outcomes.
 - ii. Results: Summarize and discuss production costs savings associated with joint commitment and dispatch.
- d. **Effort Assessment:** Medium (3 – 6 months) to High (6 months or more)
- e. **Potential Next Steps:** None
- f. **Monitor Comments:** The SPP MMU places a low priority on this issue given the complexity and feasibility of implementation across the SPP-MISO seam. The MISO IMM believes that this analysis is less useful in identifying and prioritizing seams improvements than the other issues in this scoping document.