

Memorandum

To: Organization of MISO States and Regional State Committee
From: Southwest Power Pool Market Monitoring Unit
CC: Potomac Economics, Southwest Power Pool
Date: March 11, 2019
Re: SPP MMU Response on Seams Issues

The Organization of MISO States (OMS) and Regional State Committee (RSC) have asked the internal SPP Market Monitoring Unit (MMU) and Potomac Economics (external Market Monitor for MISO) to provide a list of seams issues to help the OMS-RSC prioritize the scope of seams analysis to be conducted. Noted below are key observations along the SPP-MISO seam that the SPP MMU feels would be of most interest to the OMS-RSC.

- 1) How do transmission planning assumptions limit the ability to identify joint projects?
- 2) How do specific rules unique to each market effect seams?
- 3) How does the lack of a day-ahead Market-to-Market mechanism impact real-time seams issues?
- 4) How can transaction scheduling/interface pricing be improved to improve market outcomes?
- 5) Is Market-to-Market effectively addressing its intended purpose?
- 6) How do third party entities effect coordination of SPP/MISO seams?

The remainder of this memorandum further expands on these observations. We list specific issues that could be areas of future focus, review, and analysis. While the SPP MMU has not assessed each of these areas in depth, further studies or analyses could identify the potential benefit. We provide a recommendation for each item, and to the extent possible, we have provided an indicator of what we recommend as the priority of each issue (i.e., high, moderate, low). Ultimately, the OMS-RSC review will likely result in updating coordinated seams or internal RTO/ISO policies. These policies could be updates to tariffs, business practices, procedures, or other documents with a common goal of addressing seams concerns.

As part of the development of this memorandum, the SPP MMU has not attempted to address the full set of seams issues raised by other parties or in other forums. The absence of these items in this memorandum is not agreement or disagreement, but rather the SPP MMU has chosen not to place these items within scope of the OMS-RSC request at this time.

1) How do transmission planning assumptions limit the ability to identify joint projects?

- a. Limiting seams projects to thresholds (345kV, \$5 million minimum, etc.) overlooks problematic seams issues that would benefit from mutual planning. For example, economic projects below 345kV or below a \$5 million cost threshold masks beneficial projects for both regions while congestion costs and Market-to-Market payments continue to accumulate (i.e., Neosho to Riverton area).
- b. Each RTO/ISO has its cost allocation methodology, assumptions for separate transmission planning studies, and separate approval processes. Without clear measurable benefits to both markets and separate approval processes even for coordinated efforts, each RTO/ISO stakeholder process may view only costs without the benefits seams projects provide. The Loop One Split Rock to Lawrence area is one example of a need identified in joint studies but failed to move past regional approval processes.

These areas are highlighted in the OMS-RSC seams white paper,¹ and SPP and MISO staff continue to address some of these through the Joint Operating Agreement (JOA) and Coordinated System Plan efforts. The Neosho to Riverton area has amassed over \$27 million in Market-to-Market payments from MISO to SPP and continues to be one of the top congested constraints in SPP's market, further adding congestion costs to both markets. Net total Market-to-Market payments (from MISO to SPP) have been just under \$54 million, which does not include congestion costs incurred by each market.

MMU Recommendation: The MMU supports the continued process improvements to the Coordinated System Plan and encourages changes that remove barriers that hinder joint benefits to the transmission planning process. Given the tens of millions in direct costs and the potential for hundreds of millions in costs, addressing the issues related to transmission planning appears to have the potential to provide the highest value to both markets.

¹ See Seams White Paper for Organization of MISO States (OMS) and SPP Regional State Committee (RSC) Liaison Committee:
http://www.misostates.org/images/stories/Filings/SPP_RSC_Documents/SPP-MISO-RSC-OMS-Response_SPP_MISO-FINAL-on-website-Nov13.pdf.

2) How do specific rules unique to each market effect seams?

- a. Rules for reserving and scheduling the use of the transmission systems in both footprints creates hurdles for participants to take advantage of opportunities between the SPP and MISO markets. For example, SPP requires acquiring transmission service when using transmission in the SPP market. SPP's Holistic Integrated Tariff Team (HITT) is considering how SPP may revise its current transmission service request process.
- b. When a wind resource is no longer dispatched down by the market, SPP limits the upward ramp to prevent negative impact on constraints. For instance, power flows can swing dramatically as wind generation recovers from a downward dispatch. During an active Market-to-Market event, limiting ramp can reduce the upward swing on a non-binding constraint when SPP is the non-monitoring RTO. This feature is not present in MISO's market, which can contribute to volatility of power flow and price swings when SPP is the monitoring RTO.
- c. Pseudo-tied resources introduce complexities in managing real-time congestion, day-ahead modeling assumptions, and congestion overlap concern. This is more prevalent on the PJM/MISO seam where resources in the MISO geographical area are pseudo-tied to PJM as a capacity resource. The same concerns may exist for pseudo-tied resources between MISO/SPP as well.
- d. Outages in both markets are analyzed for reliability but are not optimized to limit adverse market impacts. Outages along the seam may not introduce reliability concerns but could create challenges for the neighboring market such as managing congestion, day-ahead and real-time price divergence, and TCR/FTR funding. MISO has attempted to address this somewhat by recently proposing penalties to generators without advanced notice of outages during emergencies. Although, this is a very limited scope in terms of outages.

Both MISO and SPP develop rules through their respective stakeholder processes. The policies or market design that come out of these processes can create barriers or challenges on the seams. Furthermore, addressing seams issues may be more challenging as some solutions could potentially require fundamental changes given the nature of some of the issues (such as the transmission service request process in SPP). To the extent there are fundamental changes required, this may provide for added complexity.

MMU Recommendation: The MMU recommends identifying rules that create limitations on neighboring regions that limit joint benefits. Addressing issues in these areas could bring moderate to high value to each region, depending on the varying degree of complexity for the different issues.

3) How does the lack of a day-ahead Market-to-Market mechanism impact real-time seams issues?

- a. Outages and other operational information is shared, however, each market commits based on its own commitment logic, offers/bids, and assumptions of external impacts on its own and neighboring systems.
- b. Firm flow entitlements and parallel flow predictions are used differently in each market's day-ahead process. This can cause inconsistent unit commitments between the seams when forecasting congestion on both systems.

Most coordination in preparing day-ahead assumptions between the regions is done through data sharing such as outages. Each area is still responsible in determining parallel flow on its own system and the impacts on external coordinated constraints. This can lead to commitment decisions that result in difficulty managing congestion in real time.

MMU Recommendation: The MMU recommends further coordination to enhance flow assumptions in the day-ahead markets. For example, how parallel flow, firm flow entitlements, and line limits are used in the day-ahead differ between markets. Lining up assumptions can provide unit commitment decisions that result in having the resources available to manage congestion in real time. Addressing these concerns has the potential to create efficiencies between the markets with moderate return.

4) How can transaction scheduling/interface pricing be improved to improve market outcomes?

- a. Each market calculates interface prices based on its own model and assumptions of what the neighboring region's price should be. These do not always align with the prices seen in the neighboring region. Correct interface pricing provides appropriate signals to the market that allows participants to react to market conditions.
- b. Coordinated transaction scheduling (CTS) attempts to provide advantages over long-standing methods of reserving transmission and scheduling practices. CTS has been implemented on other market's seams including the seam between PJM and MISO. Timing requirements can create hurdles for market participants to react to market conditions effectively.

Recent events have resulted in SPP providing MISO with energy during deficiencies. In an ideal situation, prices would have indicated opportunities for participants to react to system conditions.

MMU Recommendation: The MMU recommends further evaluating these particular items and other price spread differences between the markets. Addressing interface pricing could provide efficiencies for transactions scheduling. However, reservation and scheduling rules and congestion overlap issues would need to be addressed to see the full benefits. While this has the potential to provide moderate to high level of benefits, particularly during times of system stress, experience in other markets has indicated that coordinated transaction scheduling may not provide substantial value considering the costs to implementation and minimal usage.²

² See Coordinated Transaction Scheduling (CTS) to MISO Market Subcommittee (November 8, 2018): <https://cdn.misoenergy.org/20181108%20MSC%20Item%2010%20Post-implementation%20Review%20for%20CTS290881.pdf>.

5) Is Market-to-Market effectively addressing its intended purpose?

- a. Market-to-Market introduces situations that have led to volatility and price/power swings on constraints where both markets are providing relief. This has been a focus area of both SPP and MISO to resolve by implementing several enhancements.
- b. (same as item 2b above) When a wind resource is no longer dispatched down by the market, SPP limits the upward ramp to prevent negative impact on constraints. For instance, power flows can swing dramatically as wind generation recovers from a downward dispatch. During an active Market-to-Market event, limiting ramp can reduce the upward swing on a non-binding constraint when SPP is the non-monitoring RTO. This feature is not present in MISO's market, which can contribute to volatility of power flow and price swings when SPP is the monitoring RTO.
- c. Constraint limits are exceeded during active market-to-market events when the non-monitoring area is allowed to increase flows on a flowgate. The current design assumes when the monitoring area is unconstrained but limited capability (only a few megawatts) exists on a flowgate, the non-monitoring area can increase flows on a flowgate without regard to the limited capability. This can result in a swing above the flowgate limit and an operator taking manual actions, such as lowering constraint limits to prevent exceeding the limit.
- d. Market-to-market also does not directly account for other aspects of the market such as TCR/FTR funding and Frequently Constrained Area impacts. Congestion hedging funding can be greatly impacted by external constraints that were not projected in TCR/FTR markets because of activities in neighboring areas. Frequently Constrained Areas can also be greatly impacted by consistent external flows subjecting resources in a certain area to more stringent mitigation.

SPP and MISO have made strides in solving oscillations (power and price) by implementing shadow price overrides and switching monitoring/non-monitoring roles during market-to-market events. Several factors cause these swings such as non-synchronized market solutions, ramp of fast acting resources, both markets attempting to provide relief, and how each role adheres to constraint limits. Although enhancements have been made, volatility is still evident and discussed in SPP stakeholder groups.

MMU Recommendation: The MMU recommends continuing to address volatility issues. Recommendations might include addressing ramp of fast acting resources (see item 5b above) that can cause swings on constraints. Limiting the non-market area's market flow increase on a constraint to the limited capability (see item 5c above) is another possibility to decrease power flow swings. While actions have been taken to improve volatility, further addressing these issues could provide moderate value in relation to the market but would also address the reliability concern of power swings placing transmission and generation assets at risk.

6) How do third party entities effect coordination of SPP/MISO seams?

- a. Impacts from non-market entities are managed through other mechanisms such as transmission loading relief which does not apply cost effective relief but rather physical relief obligations.
- b. Third parties³ are also party to the MISO Midwest – MISO South contract path settlement. Discussions involving this require all parties' involvement.

Prior to markets, a majority of the Eastern Interconnect used the transmission loading relief process for administering congestion management among neighbors. Some neighbors of SPP and MISO are non-market entities and still use this process. SPP and MISO may desire to avoid this process as it is based on physical impacts rather than the preferred economic approach; however, third parties can have significant impacts on some constraints. Some situations may require the transmission loading relief process to assign a third party a specified amount of relief obligation. Without implementing this procedure, relief provided by SPP and MISO's markets accommodates third parties to serve native load.

MMU Recommendation: The MMU recommends SPP and MISO create indicators to measure third party impacts on constraints to determine when transmission loading relief may be necessary. The inter-regional Congestion Management Process Working Group⁴ is an avenue for pursuing more refined coordination processes between market and non-market entities. Because MISO represents most of the eastern seam of SPP, the interaction with third parties is lesser overall. Therefore, addressing these issues would provide more limited benefits compared to other items noted above.

³ Third parties in addition to SPP and MISO are "Joint Parties" which includes Southern Company, Tennessee Valley Authority (TVA), Associated Electric Cooperative (AECI), Louisville Gas and Electric (LG&E), Kentucky Utilities Company (KU) and PowerSouth Energy Cooperative:
<https://www.spp.org/newsroom/press-releases/spp-miso-and-joint-parties-reach-transmission-usage-agreement/>.

⁴ Congestion Management Process is a steering committee composed of seams agreement signatories consisting of; SPP, MISO, PJM, TVA, Manitoba Hydro, Associated Electric Cooperative, Inc., Minnkota Power Cooperative, Louisville Gas and Electric Company and Kentucky Utilities Company.