

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

**Managing Transmission Line Ratings
Technical Conference**

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Docket No. AD19-15-000

**PREPARED REMARKS OF J. T. SMITH
ON BEHALF OF
THE MIDCONTINENT INDEPENDENT SYSTEM OPERATOR, INC.**

I. Introduction

Good morning.

Thank you for this opportunity to speak with you about opportunities for Ambient Adjusted and Dynamic Line Ratings (AARs and DLRs) to more effectively provide value to end-use customers. At Midcontinent Independent System Operator, Inc. (MISO), I spent 13 years in the long term transmission planning environment and, now, as the Director of Operations Planning I see the impacts that transmission line ratings have on the operation of the MISO system.

It is worth pointing out the RTOs, with their large regional dispatch and efficient congestion management, are successful in capturing the value of the transmission system within its diverse footprint. In addition, MISO's market-to-market congestion management also allows more efficient use of the transmission system at the "seams" between SPP and PJM, two neighboring RTOs. As the Commission continues to look at more efficient use of the existing transmission system, the Commission can also look holistically at each interconnection for efficiency opportunities, not just within RTO regions. RTO operating principles can serve as a model for more efficient use of the transmission systems and inter-regional coordination more broadly. We appreciate that elements of that discussion are also taking place in the Commission's ongoing review of transmission incentives, and we are pleased to engage in any discussion to learn from others and advance the provision of value to customers in our footprint.

Transmission line ratings are a fundamental input to the reliable and efficient management of Bulk Electric System. Ratings are the basis of decisions made across the operating horizon including our real time operations, day-ahead management, and long term planning initiatives. A majority of the line ratings submitted to MISO already come in as seasonal ratings. These ratings enter the Energy Management System (EMS) and are propagated throughout the downstream systems. MISO also receive some dynamic ratings within its daily processes, but those focus on the real time operations environment.

MISO is currently working with the market monitor on its studies of DLR opportunities and continues to work collaboratively with the TOs to identify processes to better utilize the existing transmission infrastructure.

II. Current Capabilities and Usage

MISO has four automated ways in which we currently take line ratings into our processes with increasing dynamic rating potential with each methodology. MISO defers to the asset owner how the ratings are developed. Under the Transmission Owners Agreement and NERC standards, the Transmission Owners are responsible to derive the ratings and MISO has provided the systems in which the ratings can be utilized.

In addition to the formal hand-off processes described below, it should also be noted that MISO's congestion management procedure calls for the operator to confirm a constraint observed in MISO tools with the Transmission Operator, including confirming the rating as supplied by the four automated ways and/or obtaining a new dynamic rating if available.

Seasonal Ratings Table

Transmission Owners supply MISO with up to four seasons in this methodology. The numbers can be updated at any time during the year using the EMS Model Update Tool and MISO will implement the updates into the EMS within two business days. Approximately 93% of all line segments in MISO's operational control are updated through seasonal ratings tables and with most of the ratings reflecting only two seasons.

Temperature Ratings Table

Transmission Owners supply MISO with a temperature lookup table. The tables reflect a 10°F step function and the temperatures are supplied through the Inter-Control Center Communication Protocol ("ICCP") and internal logic applies the appropriate ratings into the system. Tables can be updated at any time during the year similar to seasonal ratings. Approximately 2% of all line segments in MISO use this capability.

Ratings Supplied via ICCP

Transmission Owners supply a rating directly to the EMS without any additional MISO interaction. Less than 1% of all line segments in MISO use this capability. ICCP submitted data for ratings and temperatures generally update hourly.

Ratings Supplied via Files

Transmission Owners supply ratings utilizing flat files on FTP servers. MISO internal logic is used to populate the ratings into the EMS. Approximately 5% of all line segments

are updated using this methodology. Current use of this system allows for a daily forecast as well as an hourly rating that is then updated throughout the operating day.

III. Benefits of Use

The use of AARs and DLRs improve market efficiency and increase utilization of the transmission system while maintaining reliability. The MISO IMM identified up to \$80M in potential annual savings if more widely utilized. Although MISO's evaluation did not produce as high a dollar savings, it did identify significant savings to potentially be available with a more broad use of dynamic ratings. Additional rating updates also provide better situational awareness across the system in regards to system capabilities in managing reliability.

IV. Technology Challenges with Increased Use

Current use of dynamic ratings has been very limited. Because of this, current systems and processes are able to handle the submitted ratings with minimal effort. However, if use increases, then it will be important for MISO to evaluate current methodologies. For example, increased ICCP or flat file submittals will require MISO to evaluate the impacts of increased frequency and volume. Current systems may not be adequate in meeting significant increases in a quick timeframe.

For explicit utilization of AARs and DLRs in the MISO Day-Ahead processes, major changes to the market engine and process changes would have to be made. A system and process would need to be established for TOs to provide forecasted dynamic ratings and the data would need to be integrated into the Day-Ahead congestion management process. Additionally, a certain level of risk is introduced into the Day-Ahead processes if dynamic ratings are used since the rating will be based on forecasted conditions instead of real time measured conditions.

V. Conclusion

It is appropriate to assess where investments in resources merit further use of AARs and DLRs. It is not likely that a one size fits all approach to the use of AARs and DLRs would serve customers best, but rather MISO suggests the continued study of opportunities for use of AAR and DLRs, as is happening in the MISO region already.

Within the MISO footprint, the responsibility to derive line ratings remains with the Transmission Owners. Because of this, MISO has established a process that provides options for Transmission Owners to submit and manage transmission line ratings that meet the needs and demands of their processes. With these options, it has been shown that utilizing a more dynamically generated line rating system can result in additional market efficiencies. It has also been shown that increased use of the capabilities can provide additional economic benefits. However, it will be important to continue to evaluate the costs to administer along with the costs of potential impacts of increased use of the existing system and how to manage its operation versus

achievable benefits. MISO is continuing to work with the market monitor on its studies of DLR and AARs and continues to work collaboratively with the TOs to identify opportunities to better utilize the existing transmission infrastructure.

Respectfully submitted,

/s/ J.T. Smith

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APPENDIX A

Panel IV: Ability of RTOs/ISOs to Accept and Utilize DLRs in Operations and Markets

Can RTOs/ISOs currently accept and use a DLR data stream from a transmission owner? What needs to be modified to address any barriers to RTOs/ISOs accepting and using DLR data streams?

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The four methodologies are a Seasonal Rating Table via the EMS Model Update Tool, Temperature Ratings Tables with temperatures supplied through ICCP, Ratings directly supplied via ICCP and Ratings supplied via flat files through an FTP service.

MISO has automated processes to support all forms of submittal. However, increased use of any would likely require MISO to update its processes and potentially infrastructure depending on the potential volume and frequency requirements.

How does the implementation of AARs by an RTO/ISO differ from implementation of DLRs? If an RTO/ISO implements the use of AARs in its software and communications capabilities and standards (data formats, internet protocols, cyber security requirements, etc.), what else must it do to implement DLRs?

Since MISO is not a Transmission Operator (TOP) we simply provide mechanism for TOs to submit ratings that they derive. We do provide temperature look up ratings (AAR) where MISO derives the ratings based on a table, with supplied temperature and pre-determined logic. Even in this case the rating is not created at MISO, it is simply one value in the table. From this stand point a RTO/ISO that is not a TOP needs to provide data formats and exchange mechanism that takes security into account. A feedback loop to handle errors would also be beneficial.

One potential difference in the application of AARs versus DLRs is that DLRs would likely need to be calculated by TOP and supplied to the RTO/ISO. Since DLRs take into consideration more than just temperature (e.g. wind speed, cloud cover, etc.) it would be more efficient for the TOP to receive these real time measured conditions and calculate a DLR that is then sent to the RTO/ISO.

What responsibilities, if any, should the RTOs/ISOs have with regard to any verification of values provided by the transmission owners? How should any disputes regarding disagreements of values between the transmission owner and RTO/ISO be resolved?

Pre-determined logic and procedures are necessary. The responsibility of the rating verification should stay with the Transmission Operator. However, IRO-010 and TOP-003 provide the context to work on these types of procedures between the Reliability Coordinator and the Transmission Operators. Currently MISO does engage in some reviews to identify if the supplied values have large deviation from nominal values supplied or previously in use values then those ratings are held and previous ratings will continue to be used. MISO communicates with TOPs prior to activating/binding any constraints. The TOP should continue to have the final determination in the transmission line rating utilized as it is their methodology that is used in its determination.

If DLRs or AARs were adopted, what if any additional coordination might be necessary? For instance, coordination across RTO/ISO seams, across transmission owner seams, or within or between reliability coordinators.

All entities need to know who the owner is of the limiting facility and have sufficient data modeling and communications established to receive ratings from the owner. In some situations depending on breaker configurations and methodologies on joint owned equipment, the limiting facility may change between TOPs and RTO/ISOs. Communications between neighboring RCs and RTO/ISOs is essential in handling these special situations.