

FERC Reliability Conference, Prepared Remarks of Michael Bryson, vice president of Operations, PJM Interconnection Reliability Issues Associated with Reliability Coordinator Seams

Thank you for the opportunity to speak today. My name is Mike Bryson, vice president of Operations at PJM Interconnection. I'm pleased to be at the 2019 Federal Energy Regulatory Commission Reliability Technical Conference to discuss the important topic of reliability issues associated with reliability coordinator seams.

PJM finds that the North American Electric Reliability Corporation (NERC) standards do a good job of outlining requirements for coordinating reliable operations between neighbors. Prior to mandatory NERC standards, we had voluntary NERC policies. These policies served the industry well until the 2003 blackout.

As a result of the former members of the Alliance RTO joining either PJM or the Midwest Independent Transmission System Operator (MISO), the Commission, appropriately concerned about seams issues, encouraged the creation of a formal joint operating agreement (JOA) between MISO and PJM. This first-of-its-kind comprehensive market-to-market seams agreement soon became a template for the development of similar agreements between adjoining market areas, as well as market to non-market areas in later years. PJM currently has JOAs with all of our neighbors; some are more robust than others, particularly where there are market-to-market seams.

How PJM Approaches Coordinating Operations in the Eastern Interconnection

PJM operates to NERC standards, which mandate that we share information needed to maintain reliability. This includes sharing day-ahead study results, load forecasts, generation outages, transmission outages and real-time telemetry with our neighbors. NERC standards also allow transmission loading relief (TLR) procedures to curtail transactions between balancing authorities for managing system operating limits and interconnection reliability operating limits. The Emergency Operations, or EOP standards, also require that we coordinate emergency plans.

Reliability Challenges for Seams

NERC standards provide a minimum level of coordination between neighbors. JOAs provide an additional level of detail that may be unique to the specific region or seam. PJM has four different types of JOAs that capture the additional coordination needed, which can be unique to that seam. While they all capture essential common elements, each agreement has different levels of detail and different technical approaches. Specifically, PJM has JOAs today with:

- Midcontinent ISO
- New York ISO
- Duke Energy Progress
- TVA

These agreements have added a layer of coordination and reliability that has added to the coordination envisioned in the NERC standards. An additional benefit of the JOAs is having more detailed sharing of data needed for smooth and reliable coordination. While it may not seem obvious, having JOAs in place to coordinate operations and planning through common market mechanisms means we have to expand our information sharing to ensure our Day-

Ahead and Real-Time Markets are as closely coordinated as possible. This leads to operations that are more reliable.

I do not believe that there are any existing or emerging reliability issues related to reliability coordinator seams and associated JOAs between PJM and other reliability coordinator areas in the Eastern Interconnection. However, I also think we have addressed a great many of the issues that gave rise to the Commission's interest in seeing JOAs develop between neighboring systems. Today, the issues that most commonly arise from the implementation of these agreements tend to be cost-assignment issues, such as redispatch costs and transmission planning costs.

A specific example of this is our agreement with TVA, which includes a provision for providing emergency energy to them in emergency conditions. Federal law prohibits TVA from reciprocating.

PJM and neighboring reliability coordinators have agreements that help coordinate operations in information sharing, outage coordination, communications, reserve sharing and congestion management. The PJM and MISO agreement, for example, addressed the following key areas:

- Exchange of information and data
- AFC calculations for coordination of transmission service
- Reciprocal coordination of flowgates
- Coordination of outages
- Joint operations in emergencies
- Coordinated transmission planning
- Joint checkout procedures for interchange
- Voltage control and reactive power coordination

Additional sections were added over time to improve coordination ownership, dispute resolution and address other issues that arose over time.

PJM and MISO have a robust process to identify planning issues across the seam. By extending market efficiency concepts across the seam under the targeted market efficiency project (TMEP) process, PJM and MISO have been able to identify low-cost, cross-seam projects that effectively reduce market-to-market flowgate congestion impacts.

An example of the benefit of the TMEP process was the December 2017 approval by the PJM Board and MISO Board of five transmission upgrade projects costing \$14.52 million, while addressing \$99.6 million in market-to-market flowgate congestion. PJM coordinates planning with our other neighbors, but it is not as effective as the PJM/MISO approach.

PJM has seen that these additional procedures, beyond NERC requirements, have contributed to even better coordination between PJM and neighboring reliability coordinators during operations. The JOAs have improved over time. At the end of June 2019, PJM and NYISO will be filing proposed changes to the JOA to improve cross-seam generation redispatch and phase angle-regulator operations to help better coordinate congestion impacts between PJM and NYISO.

With the establishment of new reliability coordinators in the Western Interconnection and the expanding Energy Imbalance Market, the list above is a good outline of issues for which the neighboring RCs might wish to focus their coordination efforts.

Future Changes Needed to JOAs

We need to continue to work on flowgate coordination and allocation among parties to the Congestion Management Protocol (CMP) – including MISO, PJM, TVA, SPP, and so on. Some of the issues I have described above are rooted in history and involve looking at new ways to allocate “rights” on flowgates, transmission planning coordination, etc. This process also needs to blend a respect for the historic usage of facilities and the need to reflect the current system topology changes and facility upgrades.

Advice for the Western Interconnection

The issues in the West are solvable problems. The JOAs and coordination agreements between reliability coordinators, ISOs and RTOs in the East provide a template for addressing these coordination issues. The NERC standards provide a good foundation, but coordination agreements help smooth the gaps in those requirements.

I would also advise reliability coordinators in the Western Interconnection to meet often, provide executive sponsorship to this important reliability function, drill on procedures, and have a robust after-the-fact feedback loop to evaluate operations and improve the coordination agreements. PJM and MISO developed a “safe operating mode” early in the JOA days. The principle of that mode is: reliable operations will govern, each side will defer to the other side in emergency conditions, and, after the fact, a formal review of events will be developed and shared.

Thank you for the opportunity to speak to you today. I look forward to answering any questions you may have.