

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

Reliability Technical Conference) Docket No. AD15-7-000

**Prepared Statement of David Zwergel
on behalf of Midcontinent Independent System Operator, Inc.**

I. Introduction

Good afternoon, I want to thank the Chairman and Commissioners for the opportunity to speak before you on emerging reliability challenges. Midcontinent Independent System Operator, Inc. (MISO) sees this as a critical time of transition in our industry. Facing an individual challenge is often very difficult, but we are currently facing numerous new challenges that are materially impacting our industry simultaneously. These changes include environmental regulations like the Mercury and Air Toxics Standards (MATS) that will lead to significant coal retirements. Furthermore, we are seeing changing investment and dispatch related to the emerging and developing economics around different fuel types, as well as a continued interconnection of variable energy generation resources and continued physical and cyber security threats. Looking to the future, it appears that significant and constant change will be the new norm.

As the grid operator for the 15 state region of the Midcontinent, MISO is focused on three main tasks: (1) running a reliable bulk electric system; (2) bringing value to customers and facilitating reliability through efficient energy market design and implementation; and (3) planning of the transmission system that will be needed to provide reliable, cost-effective. As the Senior Director of Regional Operations, I appreciate the critical reliability value of each of these tasks and the importance of each of them in addressing the emerging issues we face.

Relying solely on our historical experience is not going to be sufficient to meet these new challenges. We are going to need to expand, enhance and change our processes, procedures and thinking related to all of our key responsibilities around planning, operations and markets in order to meet these challenges that did not exist at the time the current grid was built. To protect customers from both reliability and cost perspective, we need to continue looking aggressively for opportunities to fully leverage our existing infrastructure. We also need to identify new investment needs and enhance the available reliability tools to improve the resiliency of the grid as we move forward to face these challenges.

While we in the utility industry are on the front lines in the challenge, the Commission plays a critical and vital role in facilitating advancement in our industry. It is important to note that the

Commission has historically been a leader in positioning the industry's readiness for emerging reliability challenges. This was true when the Commission encouraged open access through Order 888 and its subsequent proceedings reformed the gas industry through Order 636, provided the framework for the Regional Transmission Operators through Order 2000 and established critical transmission infrastructure planning principles through Order 1000. These milestone orders have helped provide the foundation for the industry's ability to effectively meet these emerging reliability challenges from operations, planning, and an investment standpoint.

The Commission has also pursued advancing industry dialogue on emerging issues. This role was recently on display with the Commission's focus on Gas-Electric Coordination, Fuel Assurance, and Price Formation initiatives. And it was also demonstrated by the Commission's recent national and regional workshops on the Clean Power Plan. We at MISO have benefited from the discussions as efforts have helped provide a central clearing house for ideas as the industry grapples with these emerging reliability challenges. We support and encourage the Commission to continue its facilitation role in the industry.

II. Regional Coordination Solutions

One thing that is apparent to meet these challenges is that we need to keep thinking regionally. The wider the scope we look at each of the challenges we face, the larger our set of available solutions to a given transmission constraint or reliability challenge. A larger set of alternatives allows the industry to effectively leverage and optimize existing infrastructure as well as identify the most cost effective new investments needed to meet the upcoming reliability challenges. This is, in large part, the basis of the tremendous value that RTOs bring to consumers in many regions of the country. When we refer to regional efforts, we can consider regional efforts within an RTO, but we also need to recognize regions much more broadly and holistically across the interconnections. No balancing authority is an island. In reality, each interconnection operates as a single machine or system. It is critical that actions be coordinated, in parallel with transparency to help ensure effectiveness.

While we need to look at opportunities for increased regional coordination and cooperation across the interconnections, it is even more important that we avoid losing sight of the established reliability benefits from regional dispatch as the industry considers solutions to the upcoming Clean Power Plan rule. Regional coordination and solutions allow us to leverage fully and optimize the regional fuel diversity and weather diversity across the interconnections. Also, wider coordination provides more reliable integration of variable energy resources.

As the industry continues to make advancements in the Order 1000 regional and interregional planning process, it is important to also remember that we need to be leveraging our transmission assets most efficiently from a reliability and operations standpoint. It doesn't make sense to spend years of effort on inter-regional transmission planning processes, and at the same time not make the effort to ensure that these regions operate as efficiently as possible. This coordination

can provide critical reliability and resiliency benefits during extreme weather events and help reduce the financial burden on customers at other times.

We are pleased that we have completed our first year of operations following our South Region integration. Our South region members – particularly Entergy - have identified benefits that had exceeded their initial estimates to their state regulators¹. These benefits were largely driven by the more efficient commitment and dispatch of power plants, resulting in access to lower cost generation through MISO's power market. This past spring, MISO, and SPP began their implementation of Market to Market Operations. Similar to our coordination with PJM, this allows MISO and SPP to ensure that the most cost-effective solutions are identified to relieve congestion in our respective systems and allows us to dispatch the least cost units to serve our respective loads. This is a far more elegant and effective tool than the traditional TLR approach. We also look forward to the planned October integration of WAPA into the SPP Balancing Authority and the continued coordination with them in our North Region.

III. Emerging Tools

A second area where we can improve our positioning to meet the challenges of these emerging issues is through upgrading the tools that we rely upon as an industry in our monitoring dispatch, coordination and planning. There have been many important advancements in technology in our industry and other industries that we may not be taking advantage of. When we think of maintaining and advancing reliability, we need to focus on the improvements in reliability that can be enabled from upgrading the tools and more comprehensive use of these advanced tools across the industry.

Compliance to NERC standards is a critical and fundamental practice, but we cannot become complacent and must continue to advance and leverage the new technologies in incorporating them into operations and practice. It is important to note that, while NERC standards set a bar for what is needed to maintain reliability, they do not necessarily facilitate the advancement of newer and more efficient tools that can further enhance the transparency of the overall network and improve reliability. In addition to more comprehensive use of state estimators, real time contingency analysis, and online transient stability tools, there is an opportunity to continue to operationalize the use of Synchrophasor Technology.

I would like to provide some extended remarks on three particular emerging issues:

¹ See Entergy News Releases for Arkansas, New Orleans, Louisiana and Mississippi found at:
EAI - <http://www.entergynewsroom.com/latest-news/miso-membership-produces-arkansas-jobs-millions-customer-savings/>
ENO - <http://www.entergynewsroom.com/latest-news/miso-membership-produces-millions-savings-entergy-new-orleans-customers/>
ELL/EGSL - <http://www.entergynewsroom.com/latest-news/miso-membership-produces-millions-savings-enterylouisiana-customers/>
EMI - <http://www.psc.state.ms.us/commissioners/joint/press%20releases/2015/5-14-2015%20PSC%20Entergy%20Joint%20Release.pdf>.

- Enabling Regional Solutions to Meet Clean Power Plan Challenges
- Continuing Advancement of Gas Electric Coordination
- Enhancing Reliability Operational Tools – Parallel Flow Visualization

IV. Enabling Regional Solutions to Meet Clean Power Plan Reliably Challenges

We at MISO very much appreciated the opportunity to participate in the Commission’s series of technical conferences to discuss the reliability, infrastructure and market challenges of the Clean Power Plan. We also appreciated that you mentioned the wide industry concerns involving the 2020 compliance issue in your May 15th letter to the Environmental Protection Agency.²

One issue I wish to make clear, as it often gets swept into the “market” discussion, relates to the importance of security constrained economic dispatch to the MISO region. While we do use the term “economic”, it is critical to not forget the “security constrained” elements of the RTO’s dispatch. It is important to note that “security constrained” comes first. This is no accident as the reliability of the grid is the first priority of any operator. At MISO we do more than dispatch the least cost units; our dispatch also incorporates the numerous transmission constraints and ensures adequate ancillary services to maintain reliable grid operations.

When we dispatch the system we are able to leverage the bids offered by the hundreds of resources across the footprint to solve the reliability constraints and meet customer needs at the least costs. I have considerable concerns that if there were an implementation plan that prevented the resources within our footprint from being available with an “economic” bid at a price that reflects their costs, the flexibility and reliability of the grid as a whole would be compromised. MISO would be unable to dispatch units that may meet a critical local reliability need, contingency event, or an extreme weather scenario if the unit was “self-scheduled” and not available due to a compliance plan that did not allow any reflection of compliance costs in a bid. To me, I consider this a reliability issue, not just an economic issue.

Because of this coordinated dispatch we can pool resources in a manner that reduces the needed operating reserve requirements to withstand a contingency event, in addition, we also reduce the total planning reserve margin requirement needed to maintain the one day in ten planning reserve requirement. If state implementation of the Clean Power plan does not facilitate this centralized “economic” dispatch, operating reserve requirements and planning reserve obligations will jump. In an environment where there are already concerns about the reliability implications of the upcoming retirements, a loss of “economic dispatch” will only aggravate the reliability situation if we need to get more steel in the ground simply to meet higher reserve margins.

² See the Commission’s May 15, 2015 Letter at <http://ferc.gov/media/headlines/2015/ferc-letter-epa>.

If we implement the Clean Power Plan in a way that re-balkanizes the grid, we will also have increased operational challenges in developing more wind and solar in the most economic regions of our system. This ironically would also increase the challenge in meeting the Clean Power Plans goals in a reliable and cost-effective manner.

It is critical that we work towards the development of voluntary mechanisms that provide states and utilities with the opportunity to monetize their compliance requirements and fit that compliance into our system of economic dispatch. This will not only be critical to facilitating reliability within the MISO footprint but also enabling the inter-regional reliability cooperation that has been so successful since the early days of the industry. Recall during the 2014 Polar Vortex events, MISO due to regional diversity, was able to leverage available generation resources in its South Region to help meet the emergency needs of neighboring Balancing Authority Areas. We don't want to see the loss of "economic dispatch" constrain the capability of regional or inter-regional reliability.

We are currently working on our "Phase III Study," an examination of potential electric and gas infrastructure expansion needs under the CPP, which will include cost and timeline estimates for implementation. The study will also incorporate state-level CO2 compliance, expanded reliability assessment, production cost analysis and proof-of-concept integrated gas-electric modeling. We hope to have the results later this summer. We look forward to sharing the results with you when the analysis is complete.

Once the final rule is issued, we will continue working with the states to help identify effective compliance solutions that can help support regional reliability while at the same time preserve the economic value and policy goals of the states. We welcome the Commission's continued leadership in that effort to preserve reliability, ensure needed infrastructure development tools and maintaining just and reasonable rates for electricity customers as we work to meet the challenges of the Clean Power Plan.

V. Continuing Advancement of Gas Electric Coordination

Gas is becoming an increasingly critical fuel source in the Midcontinent region. As we noted in our filing to the Commission in our Fuel Assurance Report³, the MISO region is favorably situated today in regards to gas infrastructure and abundance of supply, but this has not prevented us from moving forward to improve our coordination of gas issues on both the operations and planning side.

Over the past two years, we have begun several enhancements to our operations processes and tools to incorporate gas supply and coordination. MISO is successfully maintained reliability amid increased fuel-related outages during the last two winters and continues to

³ See Fuel Assurance Report of Midcontinent Independent System Operator, Inc. in AD14-8-000 (February 18, 2015).

incorporate lessons learned from those experiences. For instance, MISO has taken steps to refine its internal cause codes for fuel-related outages, better understand generator gas pipeline contracting practices across the fleet (including dual fuel backup capabilities, firm and interruptible transportation services), and improve overall situational awareness related to fuel issues.

MISO is also evaluating future periods after MATS coal retirements to ensure that similar levels of fuel-related outages can be reliably managed. MISO is largely comprised of vertically-integrated state-regulated utilities that have reported mechanisms to review fuel risk and cost recovery mechanisms for risk mitigation approaches. MISO is undertaking a review with its stakeholders and state regulators to assess opportunities⁴ for seasonal reforms to the current resource adequacy construct to accommodate the changing capacity resource mix, reliability and economic implications for customers.

We are also engaged in stakeholder discussions to evaluate changes to our scheduling timelines to reflect the changes in gas nomination timelines put forth in the Commission's Order 809. In fact, during discussions with MISO stakeholders around FERC Order 809, there has been increased interest by many gas-fired generators in new multi-day commitment processes, notably around severe weather periods. MISO plans to further these discussions and possibilities as they provide another opportunity for improved reliable operational processes.

We are also continuing to work with our gas pipeline operators. MISO is taking steps to increase communications with gas pipelines and leveraging the success with past efforts and trials. Looking towards the future with increased gas reliance, we are considering opportunities for prior coordination around planned gas pipeline outages if a notable number of gas-fired generators could be impacted. In such instances, MISO would welcome discussions with the pipelines before the pipelines make public notifications of such outages.

Similarly, if there is an unforeseen event impacting electric reliability, MISO would like to be able to communicate and coordinate with gas pipelines prior to the initiation of planned pipeline maintenance (if applicable). MISO appreciates this may not change planned pipeline maintenance, but at least discussions about reliability will have taken place. MISO does not currently see barriers around this type of communication and will take steps on its part to further develop practices in this area.

Looking longer term, if average capacity factors increase significantly at gas-fired generators and if we see a large number of new gas-fired generators constructed (for instance, as a result of the proposed Clean Power Plan or economic factors), infrastructure will be even more critical and likely require expansions and additions. Our Phase III CPP study might highlight future opportunities for additional planning collaboration as we identify potential infrastructure solutions.

⁴ See Fuel Assurance Report Comments of OMS in AD14-8-000 (April 21, 2015).

VI. Enhancing Reliability Operational Tools: Parallel Flow Visualization Example

As operators of the grid, we rely on a number of tools to ensure situational awareness and help inform actions needed to maintain the reliability of the grid. In normal operations, there are many resources available to maintain reliability. During these times, the decisions often focus on ensuring that the most efficient and effective resources are utilized in serving load. As system conditions tighten, or contingencies occur the options available to the operator lessens. As the choices available to the operator are reduced, the costs to maintain reliable operations go up and the reliability challenges become more severe. During these times, it is critical that operators have tools and transparency to be able to most effectively manage the interconnected grid. One example of such a tool that I wish to bring to the attention of the Commission is the Parallel Flow Visualization (PFV) project.

The PFV project is an industry initiated effort seeking to improve upon the Transmission Loading Relief (TLR) process by increasing the visualization of the current operating state of the bulk electric system, allowing reliability coordinators within the Eastern Interconnection and to better assign more representative relief obligations during periods of congestion.

With our RTO seams neighbors SPP and PJM, we are able to effectively manage congestion on our seams through Market-to-Market re-dispatch which allows the most cost-effective relief to the constraint.

In areas without a Market-to-Market Operating Agreement, the entity experiencing the congestion would have to resort to a TLR curtailment. As a practical matter, this solution is not as effective as a means of providing relief, however, what is more troubling is that the Reliability Coordinators (RCs) do not have information available to them in real-time as to the source and magnitude of parallel flows they experience in their reliability areas (other than market flows being reported by MISO, PJM and SPP every 5 minutes). The existence of parallel flows can present reliability challenges to RCs as they manage the bulk electric system. TLR 5 events, in particular, can be interpreted as a reliability concern in that firm curtailments are being requested by the RC. While not all TLR 5 events are due to parallel flows, many of these TLR 5 events occur during high regional transfers. Over the five year period 2010-2014, there were an average of 185 TLR 5 events each year with the highest number of events occurring in 2013 (313 events). This compares with an average of 141 TLR 5 events per year over the previous five year period (2005-2009) with the highest number of events occurring in 2009 (234 events). These numbers help demonstrate a need for RCs to have access to information on the source and magnitude of parallel flows.

While the PFV project will not eliminate TLRs, it will improve the effectiveness of the actions that can provide the relief. By focusing efforts on more effective mitigation of the identified constraint, the system is less likely to be constrained by mandatory, but less effective,

transaction curtailments that may exacerbate reliability challenges elsewhere and limit the available dispatch tools.

I am happy to report that recent milestone was met with the NAESB Executive Committee approval of the revised Transmission Loading Relief (TLR) standard WEQ-008 for parallel flow visualization (PFV)⁵. It has taken considerable time already to achieve this milestone; the initial drivers for PFV still exist and will continue to grow in importance as we face our emerging challenges.

The next phase of the PFV project is to have the IDC Association oversee a 12-18 month IDC software development effort to be followed by a 12-18 month field trial that will be run in parallel with the existing TLR process. We would like to urge the Commission to continue to monitor the progress on this initiative. NAESB has offered to provide periodic status reports to the Commission.

We believe that these status reports should continue to be coordinated between NERC, NAESB and the IDC Association and should be submitted on a fixed six month schedule. The status reports should describe activities completed in the previous six months, activities projected for the next six months and an indication whether the overall project is on track for completion by the end of 2017. In the event a potential delay is identified in one of the six month reports, NERC, NAESB and the IDC Association should be asked to consider steps to return the project schedule to its end of 2017 target date.

As an enhancement to the current schedule, NERC, NAESB and the IDC Association the Commission should consider inquiring whether intermediate deliverables could be accommodated without putting the overall project at risk. For example, whether the parallel flow visibility feature of this project could be made available for Reliability Coordinator usage earlier than 2018 even if these parallel flows are not subject to curtailment until after completion of the field trial, the PFV standard has been approved and ratified by NAESB membership, and the approved PFV standard is included in the business practices standards submitted to and adopted by the Commission. I would urge to Commission staff to continue to monitor PFV for progress.

⁵ NAESB Parallel Flow Visualization Project Status Report in EL14-82 (March 25, 2015).

VII. Conclusion

Reliability is job one at MISO. As we look to successfully managing the emerging issues of our industry, we see two primary areas of opportunity to managing these changes: first, ensuring we continue to leverage and enhance the opportunities of regional coordination; second, encouraging the use of best in class operations tools and procedures that can enhance and leverage situational awareness. We look forward to working collaboratively with the Commission, NERC, NAESB, our industry peers and vendors to help advance that cause. We believe it is the most effective path for a reliable and cost effective grid for our customers.

Dated June 4, 2015