Organization of MISO States

Hot Topic Response

Resilience

March 2018

Executive Summary

The State Regulatory Sector believes that resilience is currently, and correctly, addressed by a variety of parties in the MISO footprint.

The need and manner to ensure resilience varies by region. FERC appropriately recognized this variation in their order initiating Docket No. AD18-7 by specifically asking RTOs to assess resilience given their unique geographic needs.[1] MISO and its stakeholders should recognize the same variation exists within the MISO footprint, which is supported by a layered structure to ensuring resilience. OMS believes that MISO has been proactive in this area, and may not have any immediate needs to address resilience in its footprint. That said, MISO should continue to focus on regional issues, and state and local agencies should continue to be vigilant of their unique local circumstances, being mindful of how they may impact the region as a whole.

While ensuring a resilient power system requires resilience of all components of the system,[2] electricity outages overwhelmingly result from disruptions in the distribution systems (over 90 percent of electric power interruptions) both in terms of duration and frequency of outages, which are largely due to weather.[3] If power system resilience issues do arise in the future, they are likely to originate within the state jurisdictional distribution systems, where states, with a focus on resilience (and reliability) for customers, already have a number of activities underway to address potential concerns. Additionally, state responsibilities include resilience focused activities such as resource planning, assessment of disruptions, and emergency management. State regulators are also responsible for assessing the cost of resilience measures and ensuring that customers receive corresponding value. **Efforts to ensure resilience in the MISO footprint must be undertaken in partnership with state regulators.**

Hot Topic Questions

1. **Defining resilience: In its Order on Grid Resilience, FERC states that there is currently no uniform definition of resilience in the industry. FERC offers its understanding of resilience as:**

   > **"The ability to withstand and reduce the magnitude and/or duration of disruptive events, which includes the capability to anticipate, absorb, adapt to, and/or rapidly recover from such an event."**

   What are your sector's views on this meaning? How is resilience related to and distinguishable from reliability?

[1] AD18-7 at 19-20.

[2] Including transmission, distribution, supply, operational controls, and communications networks.

[3] Department of Energy, Quadrennial Energy Review, Second Installment at 4-2 (2017)

The State Regulatory Sector is generally fine with the definition put forward by FERC as a qualitative concept. Resilience is a system-wide issue that involves all levels of the electric grid and regulatory structure with the majority of relevant decision makers on the state and local level, and as such, specific standards for resilience may not be needed at the FERC-level. OMS notes that utilities and their regulators have long been addressing resilience through normal processes (*e.g.*, fuel diversity considerations in resource planning, service quality monitoring, and investing in distribution systems), as well as through recent actions (*e.g.*, grid modernization efforts, distribution planning, state energy assurance and cybersecurity plans). These actions occur because state and local regulators are charged with maintaining reliable electric service to all customers at reasonable rates, and as challenges to carrying out this task manifest themselves, action is taken.

Our sector believes key differentiators between resilience and reliability are the frequency and magnitude of the event. Reliability standards are put in place to address potentially-frequent, well-known issues from occurring. For example, reliability standards contemplate the loss of a generator or a transmission line while discussions of resilience tend to focus on more catastrophic events such as the loss of an interstate natural gas pipeline or the loss of major portions of the distribution system. Resilience deals with the high-impact low frequency events that are less well defined and predictable. Resilience measures enhance reliability. Resilience is not just about reducing outages, it is also about limiting the scope and impact of outages when they do occur, restoring power rapidly afterwards, and learning from these experiences to better deal with events in the future.[4]

2. **Assessing resilience: How does your sector assess the current state of resilience in the MISO region*? What key attributes of resilience should the electric system possess? In your response, please address what your sector sees as the threats to resilience in the MISO region*, and what are the impact and likelihood of each.**

Assessment

The State Regulatory Sector assesses resilience through a variety of ways, including state and local planning processes. These can take the form of emergency management planning, review of historical disruptive events, and participation in regional training and assessments of such disruptive events. First, traditional resource planning processes incorporate a wide range of considerations, including assessing factors that could disrupt electric service to customers. For example, state and local regulators typically analyze accessibility to fuel, distribution system reliability metrics and utility design standards, and other resource performance metrics when assessing the appropriate type of resource to meet an identified need.

Second, our sector has taken a variety of actions to assess and respond to historic disruptions to electric service based on the nature of the disruption. Since the causes of major disruptions are often unique to local circumstances, the assessment of these events, and the reactions to them, can

[4] National Academies of Sciences, Engineering, and Medicine. 2017. *Enhancing the Resilience of the Nation's Electricity System.* At S-1.

vary throughout the footprint. For example, after the 2017 ice storm in Michigan, the Michigan Public Service Commission (Michigan PSC) issued an order[5] directing the state's largest utilities to: file reports detailing their response to the event, analyze why systems were affected, and outline the role of Advanced Metering Infrastructure during and after the event. After receiving the reports, the Michigan PSC directed the utilities to work with Commission staff to better prepare and respond to similar major weather events in the future. State-led investigations are a key part of this review process. Once completed, a variety of recommendations can be made, ranging from changes to design standards, incentives to increase operational performance, or increased infrastructure investments to address identified issues. The State Regulatory Sector also regularly participates in the MISO-led stakeholder discussions that review historic operational events, which help inform state and local reviews.

Third, national and state emergency management drills and risk assessments are another way state and local regulators assess resilience. Drill scenarios can test the ability to withstand and respond to natural disasters, cyber-attacks, and physical attacks. Identification of gaps within existing processes and communication platforms is a typical result of conducting these drills. Collectively, the drills represent a key proactive step that all levels of the industry can take to assess resilience. For instance, many OMS members participate in all NERC GridEx events. Another example involves the State of Wisconsin developing a detailed, long-term power outage exercise with local authorities that includes field exercises.

Key Attributes

The State Regulatory Sector believes key attributes of resilience are the following:

- Mutual assistance
- Geographic diversity
- Maintaining cyber-security
- The ability to utilize many distributed resources
- Network nature of grid
- International, inter- and intra-regional cooperation and communication

Threats to Resilience

The threats to resilience within the MISO footprint include extreme weather events, seismic events, cyber threats, and physical attacks. Weather events, such as hurricanes and ice events, could limit access to resources by disrupting natural gas supply and impacting transmission and generation. There is also a risk of seismic events occurring within the MISO region, especially along the New Madrid fault line. Cyber threats could range from minor malware software to a catastrophic impact event. In addition, electro-magnetic disturbance events such as geomagnetic disturbances or an electromagnetic pulse (EMP) can impact large portions of both the bulk electric system (BES) and distribution system.

[5] U-18346, Michigan Public Service Commission, March 16, 2017.

OMS sees the primary threat to resilience coming from disruptions in the delivery of electricity, not the generation thereof. Electricity outages overwhelmingly result from disruptions in the distribution systems (over 90 percent of electric power interruptions) both in terms of duration and frequency of outages, which are largely due to weather.[6] Therefore, focus should continue to be placed on limiting disruptions of service caused by the distribution system, and to a lesser extent the transmission system. This is especially important given the geographic size and predominantly rural nature of the MISO footprint. These two characteristics lend themselves to a large number of total miles of transmission and distribution lines per customer, which can render the economics of enabling resilience through redundancy expensive.

3. **Mitigating resilience threats: Are there any changes or actions that your sector believes would mitigate risks to resilience in the MISO region*, including modifications to market-based constructs, operating procedures, standards, or planning processes?**

MISO has been, and continues to be, proactive with its markets to help alleviate resiliency threats. Examples include: the "ramp product," emergency pricing modifications, and the use of Dispatchable Intermittent Resources. MISO also has plans that will help mitigate risks to resilience through improvements to its Automatic Generation Control (AGC) and Resource Availability and Need (RAN) assessment. In addition to these market mechanisms, MISO's transmission planning process is very robust, with sub-regional planning meetings that can actively address more local needs.

In addition to the many state actions and activities outlined above, the Organization of MISO States has identified Distributed Energy Resources (DERs) as a strategic priority. In its recent report on enhancing the resilience of the nation's electric system, the National Academy of Sciences found that DERs have a largely untapped potential to improve the resilience of the electric power system but do not contribute to this inherently – rather, resilience implications must be explicitly considered during planning and design decisions.[7]

As noted above, state and local regulators regularly participate in regional and state emergency management drills and risk assessments that help to mitigate resilience threats. State and local regulators are also included in the spring and fall drills performed by MISO. Risk assessments include identifying critical infrastructure and key resources, assessing the threats and vulnerabilities of those assets, and evaluating the consequences of losing a vulnerable asset. The resulting risk management strategies can help consider the numerous priorities and resources available to reduce identified resilience risks.[8]

---

[6] Department of Energy, Quadrennial Energy Review, Second Installment at 4-2 (2017)
[7] National Academies of Sciences, Engineering, and Medicine. 2017. *Enhancing the Resilience of the Nation's Electricity System.* At 4-77.

[8] http://www.michigan.gov/documents/cybersecurity/120815_Michigan_Cyber_Disruption_Response_Plan_Online_Version_003_544764_7.pdf.

Going forward, MISO should continue to focus on planning process implications of the changing resource mix. MISO has undertaken several focused studies in this area, and proper stakeholder review should be conducted to assess the potential incorporation of any findings into the MTEP process. In addition, MISO and stakeholders should review the current list of drills and other scenario-based activities it participates in to determine if more are needed.

4. **Sharing responsibilities and prioritizing resilience efforts: How should responsibilities for resilience be shared among utilities, regulators, MISO and others on both the distribution and transmission levels of the system? How much priority should MISO place on resilience-related efforts compared to the other issues that face our region? How does your sector prioritize resilience, and where are you focusing your efforts (planning, cyber, distribution recovery, etc.)?**

Within the MISO footprint, the priorities of the State Regulatory Sector can vary greatly due to differing risks to the distribution, generation, and transmission assets. The layering of responsibilities, throughout multiple levels of government and inclusive of agencies other than electric regulators, that are already in place within the footprint may be an ideal approach to ensuring resilience. Historically within MISO, state and local regulators have been ensuring resilience on the distribution systems and adverse impacts to the BES have been minimal.

MISO is not the owner of the critical assets of the BES. The Transmission Owners (TOs), utilities, and other market participants are the asset owners and should have fuel assurance plans in place that prioritize these assets and explain how their owners will safeguard them. This leaves MISO with the key role of communicating important regional needs to these asset owners and resource operators. The region-wide look that MISO is able to provide to these parties is more than any one of them can achieve on their own. Likewise, the appropriate actions those parties should take in order to prepare for and respond to disruptive operational events is more than any one centralized organization can achieve. MISO should prioritize providing accurate and useful information to TOs and generator owners who can then coordinate with state and local regulators and the appropriate emergency operations centers. Another key role for MISO involves communication with neighboring regions.

Lastly, there are more than just the commissions, utilities, and MISO in this discussion. State legislatures and local governments can have a very direct and active role in this area. As many of the emergency preparedness functions involve multiple state agencies, the role of the State Regulatory Sector can evolve as state legislatures and local governments deem appropriate. Many other sectors of the economy can also play key roles, which can require cooperation of the business community and civil society.