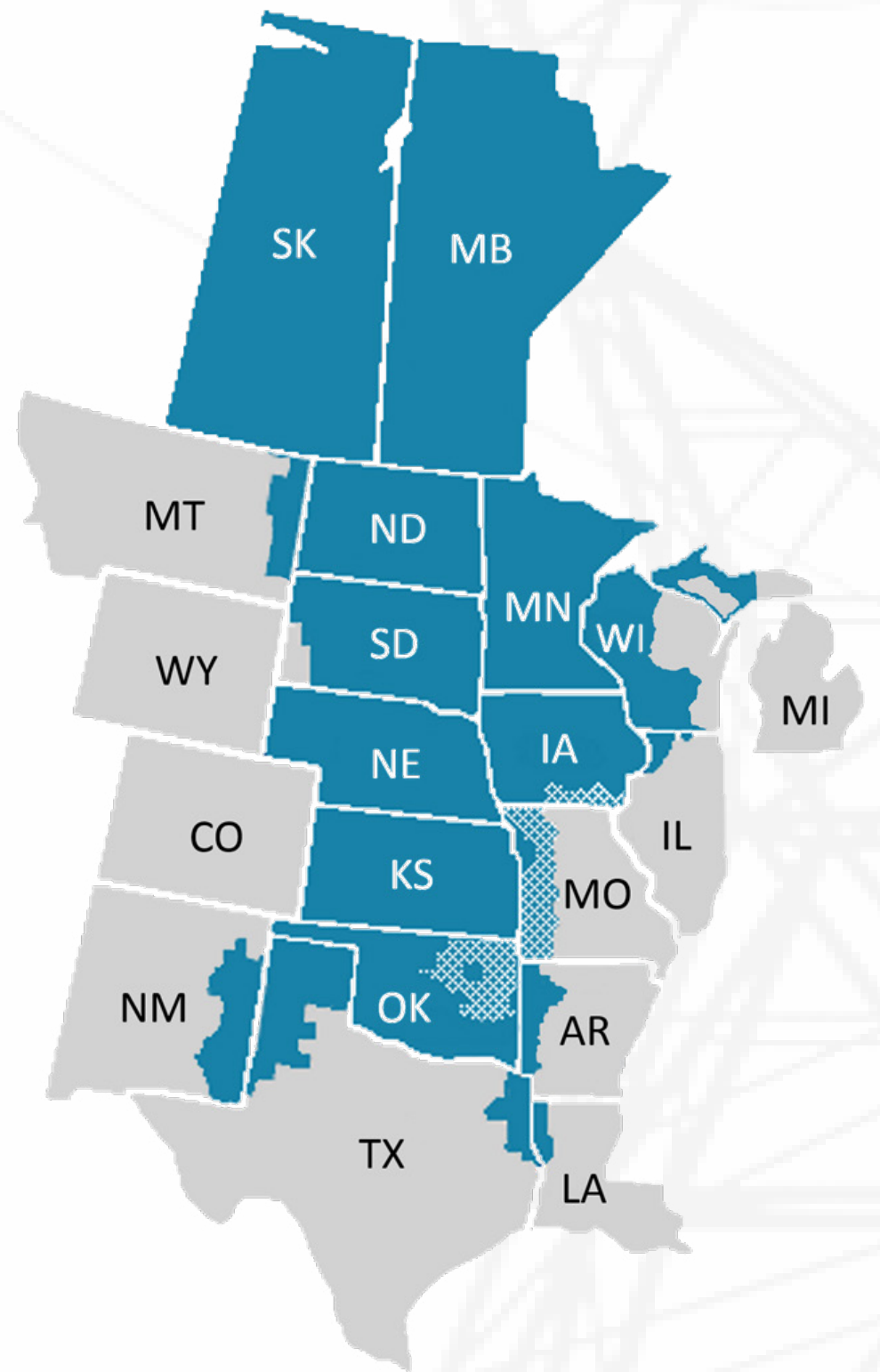




MRO 2023 Regional Risk Assessment

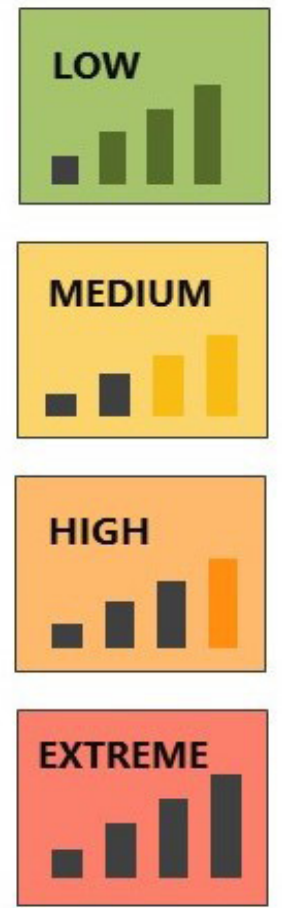
Top risks to the reliable and secure operation of the North American bulk power system in MRO's regional footprint.

Territory



MRO Reliability Risk Matrix: Risk Rankings

Consequence / Impact (C)		Likelihood (L)				
		L1 Very Unlikely	L2 Unlikely	L3 Possible	L4 Likely	L5 Almost Certain
C5	Severe					
C4	Major				4,5,6,16	
C3	Moderate		2	9,12,13	1	
C2	Minor			3,7,8,10,14,17	15	
C1	Negligible			11		



Assessment Overview

- Extreme weather, consumer demand, and changes in technology and generation resources continue to present a rapidly increasing number of challenges to grid planners and operators. Physical and cyber security risks also continue to evolve at an unprecedented pace.
- MRO's annual *Regional Risk Assessment* considers continent-wide risks to reliability and security of the North American bulk power system and determines which are more likely to occur and would have a higher impact in MRO's region.
- This report is focused on risk identification, prioritization and mitigation and highlights for industry the priorities needed to collaboratively address these challenges. It also serves to inform key decision makers of challenges the industry faces and the policies and regulations that will help define a variety of proposed solutions.
- [READ MRO'S 2023 REGIONAL RISK ASSESSMENT](#)

Top risks are reflected in orange above and described below. A full list of risks assessed can be found in the final report.

Key Findings: Top Reliability and Security Risks in MRO's Territory

Model Assumptions	Planning Reserves	Energy Reliability	Generation Unavailability	Transmission Line Ratings	Insider Threats	Malware/Ransomware	Supply Chain Compromise
<p>RISK 1. Assumptions used in bulk power models to plan and operate the grid have not accounted for the rapid increase in inverter-based and distributed energy resources, challenging industry's ability to accurately assess current and future system characteristics.</p>	<p>RISK 4. Traditional methods to calculate Planning Reserve Margin are inadequate to properly plan for the generation capacity needed to meet increasingly uncertain system operations, especially during extreme weather events.</p>	<p>RISK 5. Increased uncertainty from changing energy supply and customer demand challenge the grid's ability to meet load for all hours of the year. There is no comprehensive planning that assesses assurance of available energy and fuel sources over all time periods to maintain grid reliability.</p>	<p>RISK 6. Generation availability assumed during cold weather, particularly in the southern U.S., has been shown to be unrealistically high due to a lack of generation winterization and natural gas curtailments.</p>	<p>RISK 12. Use of constant overhead transmission line ratings year-round (non-seasonal) limits available transmission capacity and leads to inefficient real-time decisions when system conditions deviate from assumptions that drive rating calculations, such as cooler temperatures or during emergency operations.</p>	<p>RISK 9. Employees or contractors using their knowledge and authorized access of critical systems to do harm to the bulk power system is a continued, substantial threat to organizations and the reliability of the grid.</p>	<p>RISK 13. Phishing attacks can introduce malware or ransomware to corporate IT systems, which can impact critical systems necessary for reliable bulk power system operations through direct or in-direct connections those systems have to IT networks.</p>	<p>RISK 16. A cyber security event carried out through the vendor supply chain can broadly impact bulk power system reliability, especially where the vendor is a market leader providing systems used for system operation.</p>

About Us

As part of the [ERO Enterprise](#), MRO is committed to a shared mission to identify, prioritize and assure effective and efficient mitigation of risks to the reliability and security of the North American bulk power system in its regional footprint.

Read more at www.MRO.net