



MIDWEST  
RELIABILITY  
ORGANIZATION

# Meeting Agenda

Reliability Advisory Council (RAC)

May 18, 2023

9:00 am to 3:00 pm central

*MRO Corporate Offices, King Conference Center  
St. Paul, MN & Webex*

Classification: **Public**

CLARITY  
Outreach & Engagement

ASSURANCE  
Oversight & Risk Management

RESULTS  
Reliability Performance

## **VIDEO AND AUDIO RECORDING**

Please note that Midwest Reliability Organization (MRO) may make a video and/or an audio recording of this organizational group meeting for the purposes of making this information available to board members, members, stakeholders and the general public who are unable to attend the meeting in person.

By attending this meeting, I grant MRO:

1. Permission to video and/or audio record the meeting including me; and
2. The right to edit, use, and publish the video and/or audio recording.
3. I understand that neither I nor my employer has any right to be compensated in connection with the video and/or audio recording or the granting of this consent.

**Classification: Public**

## MRO ORGANIZATIONAL GROUP GUIDING PRINCIPLES

These MRO Organizational Group Guiding Principles complement charters. When the Principles are employed by members, they will support the overall purpose of the organizational groups.

Organizational Group Members should:

1. Make every attempt to attend all meetings in person or via webinar.
2. Be responsive to requests, action items, and deadlines.
3. Be active and involved in all organizational group meetings by reviewing all pre-meeting materials and being focused and engaged during the meeting.
4. Be self-motivating, focusing on outcomes during meetings and implementing work plans to benefit MRO and MRO's registered entities.
5. Ensure that the organizational group supports MRO strategic initiatives in current and planned tasks.
6. Be supportive of Highly Effective Reliability Organization (HERO™) principles.
7. Be supportive of proactive initiatives that improve effectiveness and efficiency for MRO and MRO's registered entities.

Classification: **Public**

## MRO RELIABILITY ADVISORY COUNCIL Q2 MEETING AGENDA

### Agenda Item

**1 Call to Order and Determination of Quorum**

*Dick Pursley, Reliability Advisory Council Chair*

- a. Determination of Quorum and Introductions
- b. Robert's Rules of Order

**2 Standards of Conduct and Antitrust Guidelines**

*Bryan Clark, Director of Reliability Analysis, MRO*

**3 Chair's Remarks**

*Dick Pursley, Reliability Advisory Council Chair*

**4 Consent Agenda**

*Dick Pursley, Reliability Advisory Council Chair*

- a. Approve March 1, 2023 meeting minutes
- b. Review RAC Charter
- c. Review PRS Charter

**5 MRO Board of Directors, OGOC and General Update**

*Bryan Clark, Director of Reliability Analysis, MRO*

**6 2023 Reliability Conference Debrief**

*Bryn Wilson, Reliability Advisory Council Member*

**7 NERC RSTC Meeting Update**

*John Stephens, Reliability Advisory Council and RSTC Member*

### Break – 10:00 a.m.

**8 MRO Representatives on NERC Subgroups – Written Reports**

*Bryan Clark, Director of Reliability Analysis, MRO*

- a. NERC Electric Gas Working Group (EGWG) – *Jaimin Patel*
- b. NERC Inverter-Based Resource Performance Subcommittee (IRPS) – **No report**
- c. NERC System Planning Impacts from DER Working Group (SPIDERWG) – *Wayne Guttormson*
- d. NERC System Protection and Control Working Group (SPCWG) – *Lynn Schroeder*
- e. NERC Energy Reliability Assessment Task Force (ERATF) – *Tom Whynot*

**9 2023 Work Plan Update**

*Dick Pursley, Reliability Advisory Council Chair*

- a. Review Action Items

**10 Reliability Coordinator Updates**

- a. MISO – *Durgesh Manjure, RAC Member*
- b. SPC – *Binod Shrestha, RAC Member*
- c. SPP – *CJ Brown, RAC Member*

### Lunch 12:00 p.m.

**11 MRO Regional Summer Assessment (RSA)**

*Salva Andiappan, Principal Reliability Assessment Engineer, MRO*

**12 Feedback on 2023 Regional Risk Assessment**

*Mark Tiemeier, Principal Technical Advisor, MRO*

**13 NERC Lessons Learned Review**

*John Grimm, Principal Systems Protection Engineer, MRO*



## MEETING AGENDA – Reliability Advisory Council (RAC) – May 18, 2023

- 14 NERC Standards Review Forum (NSRF) Update**  
*Gayle Nansel, Reliability Advisory Council Vice Chair*
- 15 Protective Relay Subgroup (PRS) Update**  
*Jake Bernhagen, Manager of Reliability Performance, MRO*
- 16 2023 Meeting Dates**  
*Dick Pursley, Reliability Advisory Council Chair*
- 17 RAC Member Roundtable**  
*Reliability Advisory Council Members*
- 18 Other Business and Adjourn**  
*Dick Pursley, Reliability Advisory Council Chair*

Classification: **Public**

## MEETING AGENDA – Reliability Advisory Council (RAC) – May 18, 2023

### AGENDA

#### Call to Order and Determination of Quorum

a. Determination of Quorum

***Dick Pursley, Reliability Advisory Council Chair***

Name	Role	Company	Term
Andy Witmeier	Member	MISO	12/31/24
Binod Shrestha	Member	Saskatchewan Power Corporation	12/31/25
Bryn Wilson	Member	Oklahoma Gas & Electric	12/31/23
CJ Brown	Member	Southwest Power Pool	12/31/24
Dallas Rowley	Member	Oklahoma Gas & Electric	12/31/25
Derek Brown	Member	Evergy	12/31/23
<b>Dick Pursley</b>	<b>Chair</b>	Great River Energy	12/31/25
Durgesh Manjure	Member	MISO	12/31/23
<b>Gayle Nansel</b>	<b>Vice Chair</b>	Western Area Power Administration	12/31/25
Jason Weiers	Member	Otter Tail Power Company	12/31/24
Jeremy Severson	Member	Basin Electric Power Cooperative	12/31/24
John Stephens	Member	City Utilities of Springfield Missouri	12/31/23
Nandaka Jayasekara	Member	Manitoba Hydro	12/31/25
Ron Gunderson	Member	Nebraska Public Power District	12/31/23
Open			12/31/24

**Classification: Public**

## AGENDA

### Call to Order and Determination of Quorum

b. Robert's Rules of Order

*Dick Pursley, Reliability Advisory Council Chair*

**Parliamentary Procedures.** Based on Robert's Rules of Order, Newly Revised, Tenth Edition

**Establishing a Quorum.** In order to make efficient use of time at MRO organizational group meetings, once a quorum is established, the meeting will continue, however, no votes will be taken unless a quorum is present at the time any vote is taken.

**Motions.** Unless noted otherwise, all procedures require a "second" to enable discussion.

When you want to...	Procedure	Debatable	Comments
Raise an issue for discussion	Move	Yes	The main action that begins a debate.
Revise a Motion currently under discussion	Amend	Yes	Takes precedence over discussion of main motion. Motions to amend an amendment are allowed, but not any further. The amendment must be germane to the main motion, and cannot reverse the intent of the main motion.
Reconsider a Motion already resolved	Reconsider	Yes	Allowed only by member who voted on the prevailing side of the original motion. Second by anyone.
End debate	Call for the Question or End Debate	No	If the Chair senses that the committee is ready to vote, he may say "if there are no objections, we will now vote on the Motion." Otherwise, this motion is not debatable and subject to majority approval.
Record each member's vote on a Motion	Request a Roll Call Vote	No	Takes precedence over main motion. No debate allowed, but the members must approve by majority.
Postpone discussion until later in the meeting	Lay on the Table	Yes	Takes precedence over main motion. Used only to postpone discussion until later in the meeting.
Postpone discussion until a future date	Postpone until	Yes	Takes precedence over main motion. Debatable only regarding the date (and time) at which to bring the Motion back for further discussion.

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## MEETING AGENDA – Reliability Advisory Council (RAC) – May 18, 2023

Remove the motion for any further consideration	Postpone indefinitely	Yes	Takes precedence over main motion. Debate can extend to the discussion of the main motion. If approved, it effectively “kills” the motion. Useful for disposing of a badly chosen motion that cannot be adopted or rejected without undesirable consequences.
Request a review of procedure	Point of order	No	Second not required. The Chair or secretary shall review the parliamentary procedure used during the discussion of the Motion.

### Notes on Motions

**Seconds.** A Motion must have a second to ensure that at least two members wish to discuss the issue. The “seconder” is not required to be recorded in the minutes. Neither are motions that do not receive a second.

**Announcement by the Chair.** The chair should announce the Motion before debate begins. This ensures that the wording is understood by the membership. Once the Motion is announced and seconded, the Committee “owns” the motion, and must deal with it according to parliamentary procedure.

### Voting

Voting Method	When Used	How Recorded in Minutes
	When the Chair senses that the Committee is substantially in agreement, and the Motion needed little or no debate. No actual vote is taken.	The minutes show “by unanimous consent.”
Vote by Voice	The standard practice.	The minutes show Approved or Not Approved (or Failed).
Vote by Show of Hands (tally)	To record the number of votes on each side when an issue has engendered substantial debate or appears to be divisive. Also used when a Voice Vote is inconclusive. (The Chair should ask for a Vote by Show of Hands when requested by a member).	The minutes show both vote totals, and then Approved or Not Approved (or Failed).
Vote by Roll Call	To record each member’s vote. Each member is called upon by the Secretary, and the member indicates either  “Yes,” “No,” or “Present” if abstaining.	The minutes will include the list of members, how each voted or abstained, and the vote totals. Those members for which a “Yes,” “No,” or “Present” is not shown are considered absent for the vote.

**Classification: Public**

## MEETING AGENDA – Reliability Advisory Council (RAC) – May 18, 2023

### Notes on Voting.

**Abstentions.** When a member abstains, he/she is not voting on the Motion, and his/her abstention is not counted in determining the results of the vote. The Chair should not ask for a tally of those who abstained.

**Determining the results.** A simple majority of the votes cast is required to approve an organizational group recommendations or decision.

**“Unanimous Approval.”** Can only be determined by a Roll Call vote because the other methods do not determine whether every member attending the meeting was actually present when the vote was taken, or whether there were abstentions.

**Electronic Votes** – For an e-mail vote to pass, the requirement is a simple majority of the votes cast during the time-period of the vote as established by the Committee Chair.

**Majorities.** Per Robert’s Rules, as well as MRO Policy and Procedure 3, a simple majority (one more than half) is required to pass motions

**Classification: Public**

## AGENDA

### **Standards of Conduct and Antitrust Guidelines** *Bryan Clark, Director of Reliability Analysis, MRO*

#### **Standards of Conduct Reminder:**

Standards of Conduct prohibit MRO staff, committee, subcommittee, and task force members from sharing non-public transmission sensitive information with anyone who is either an affiliate merchant or could be a conduit of information to an affiliate merchant.

#### **Antitrust Reminder:**

Participants in Midwest Reliability Organization meeting activities must refrain from the following when acting in their capacity as participants in Midwest Reliability Organization activities (i.e. meetings, conference calls, and informal discussions):

- Discussions involving pricing information; and
- Discussions of a participants marketing strategies; and
- Discussions regarding how customers and geographical areas are to be divided among competitors; and
- Discussions concerning the exclusion of competitors from markets; and
- Discussions concerning boycotting or group refusals to deal with competitors, vendors, or suppliers.

**Classification: Public**

## AGENDA

### Chair's Remarks

*Dick Pursley, Reliability Advisory Council Chair*

### Action

Information

### Report

Chair Pursley will lead this discussion during the meeting.

Classification: **Public**

## MEETING AGENDA – Reliability Advisory Council (RAC) – May 18, 2023

### AGENDA

#### Consent Agenda

- a. Approve March 1, 2023 meeting minutes
- b. Review RAC Charter
- c. Review PRS Charter

*Dick Pursley, Reliability Advisory Council Chair*

#### Action

Discussion

#### Report

Chair Pursley will lead this discussion during the meeting.

Classification: **Public**





## **Draft Minutes of the Reliability Advisory Council Meeting**

### **Hybrid: St. Paul, MN and Webex**

*Wednesday, March 1, 2023, 9:00 a.m. to 3:02 p.m. Central*

*Notice for this meeting was electronically posted to the [MRO website](https://www.mro.net) on February 1, 2023.  
A final agenda, including advanced reading materials, was also posted on February 22, 2023.*

#### **1. Call to Order and Determination of Quorum**

The Reliability Advisory Council (RAC) Chair, Dick Pursley called the meeting to order at 9:00 a.m. Pursley welcomed everyone and introductions were made. Reliability Analysis Administrator, Rebecca Schneider, advised the chair that a quorum of the RAC was present. A complete list of attendees is included as [Exhibit A](#).

#### **2. Standards of Conduct and Antitrust Guidelines**

Pursuant to Policy and Procedure 4, Bryan Clark, MRO Director of Reliability Analysis, highlighted MRO's Standards of Conduct and Antitrust Guidelines.

#### **3. Chair's Remarks**

Chair Pursley noted the presentation Professor Meghan O'Sullivan, Harvard University's Kennedy School, gave at MRO's Board of Directors Meeting on December 1, 2022. Her topic was "The Geopolitics of the Energy Transition." Pursley highlighted several items from the breakout session during the Organizational Group Oversight Committee (OGOC) meeting on November 30, 2022. During the session, members of the RAC and the OGOC discussed some of the top Operational and Planning Reliability Risks and reviewed the draft 2023 RAC Work Plan.

Pursley noted Minnesota's new legislation for 100 percent clean energy by 2040. He also noted FERC approval of the cold weather reliability standards (EOP-011 and EOP-012) on February 12, 2023. Pursley highlighted activity on the System Planning Impacts from DER Working Group (SPIDERWG), including openings on the standard drafting team for NERC Project 2023-02 Performance of IBRs. Standard PRC-004-6 is affected by this project. The nomination period is open until March 23, 2023.

#### **4. New Members' Welcome Presentation**

Bryan Clark, MRO Director of Reliability Analysis, reviewed the welcome presentation for new members including the advisory council structure, OGOC roster, and guiding principles for council members. Clark also highlighted MRO's diversity initiative for organizational groups. He gave an overview of the RAC membership and thanked the past and current Chair and Vice Chair for their leadership. Clark touched on the RAC key responsibilities and noted the upcoming Annual Reliability Conference in May 2023.

#### **5. Consent Agenda**

The RAC reviewed the consent agenda, which included draft minutes from the November 16, 2022 meeting.

*Upon a motion duly made and seconded, the RAC approved the consent agenda in its entirety.*



## **6. MRO Board of Directors, OGOC and General Update**

Clark provided a recap of the fourth quarter OGOC meeting on November 30, 2022. The RAC's 2022 accomplishments were highlighted. There was a small group breakout session during which the draft 2023 RAC work plan was reviewed. The group also discussed the Regional Risk Assessment (RRA) and determined focus areas for the RAC in 2023. Notable items included, bulk power modeling accuracy and expertise in modeling. The OGOC suggested that MRO staff be included on NERC Rep quarterly calls.

A RAC member suggested that the RRA be utilized when developing conference agendas and/or webinar topics to ensure alignment with the top risks in our region.

## **7. Reliability and Security Technical Committee Meeting Update**

Reliability Advisory Council and RSTC member, John Stephens, provided a recap of the Reliability and Security Technical Committee (RSTC) meeting from December 6-7, 2022. Stephens reviewed the accomplishments the committee has achieved and noted the many completed items in his report. The RSTC has reviewed a draft Standard Authorization Request (SAR) for FAC-001 and FAC-002 presented by the NERC SPIDERWG. There was discussion around outreach efforts to promote the Reliability Guidelines approved by the RSTC. The next meeting is scheduled for March 22-23, 2023.

## **8. MRO Representatives on NERC Subgroups**

### *NERC Electric Gas Working Group (EGWG) – Jaimin Patel*

Patel reviewed the 2023-24 EGWG Work Plan, and the five primary work plan items. The EGWG has approved and posted the Design Basis for a Natural Gas Study White Paper. The next meeting is March 9, 2023.

### *NERC Inverter Based Resource Performance Subcommittee (IRPS) – David Brauch*

The IRPS had not met since the last RAC meeting. No update was provided.

### *NERC System Planning Impacts from DER Working Group (SPIDERWG) – Wayne Guttormson*

Guttormson provided a recap of the meeting held on February 1-2, 2023. Guttormson reviewed the general activities since the last meeting. He also highlighted several deliverables being submitted for RSTC action at the March 2023 meeting, including two SARs submitted for endorsement, a Reliability Guideline for approval, and a SAR for revisions to MOD-031 Standard for review. The RSTC approved a Distributed Battery Energy Storage White Paper. The next meeting is scheduled for May 2-3, 2023.

### *NERC System Protection and Control Working Group (SPCWG) – Lynn Schroeder*

Schroeder provided an update on the development of a position paper related to FERC Order 881 and the potential impact on PRC-023. In summary, the SPCWG believes that no changes to PRC-023-4 are necessary and that the systems do not need to be set to meet the margin required in PRC-023-4 for the Ambient Adjusted Rating (AAR). However, the SPCWG does recommend that entities review all protection system loadability for relays to which PRC-023-4 applies and any new lines that fall under the orders to ensure a sufficient margin above anticipated normal and emergency AAR. A final draft is scheduled for approval by the working group next month, followed by the RSTC in May.

Schroeder also noted several accomplishments, including PRC-019 Implementation Guidance posted for industry and cold weather recommendations addressed by SPCWG and provided to the RSTC.



### *NERC Energy Reliability Assessment Task Force (ERATF) – Tom Whynot*

Whynot shared a draft white paper released in February 2023 by the ERATF entitled “Considerations for Performing an Energy Reliability Assessment” which was distributed to the RAC members for review. There is growing concern around fuel assurance in current energy assessments. The ERATF is introducing two standards (operational and planning) for energy assessments to evaluate capacity. It was noted that energy reliability planning is a topic the RAC is considering for a webinar. The next meeting is in person on March 21, 2023. Discussion ensued.

## **9. 2023 Work Plan Update**

### *Action Item Review*

Chair Pursley reviewed the action items in the 2023 work plan. Updates were made accordingly. Discussion ensued.

*Upon a motion duly made and seconded, the RAC approved the 2023 work plan.*

### *NERC Rep Guidance Document*

The RAC reviewed the guidance document drafted by MRO staff intended to be used as a guideline for the MRO sponsored NERC Representatives discussion meetings. The document will be distributed to the NERC Reps, RAC members and liaisons for further review via email.

### *2023 Reliability Conference Update*

RAC member, Bryn Wilson, provided an update on the 2023 Reliability Conference scheduled for May 17, 2023 in St. Paul, Minnesota. There was discussion around the draft agenda.

## **10. Reliability Coordinator Updates**

### *Midcontinent Independent System Operator (MISO)*

RAC member, Andy Witmeier, provided an oral report. Witmeier noted that last fall was unremarkable, and there are no reliability issues expected for the spring season. There were no issues during hurricane season. Winter was relatively uneventful except for the storm that occurred on Christmas Eve (Elliot). During Winter Storm Elliot, MISO lost generation due to the cold weather, and load unexpectedly peaked on Friday, December 23. MISO's load forecast was off roughly five percent during Elliot. However, they were able to export power to others during the event using emergency generation. There is a NERC/FERC Joint Inquiry in progress.

### *Saskatchewan Power Corporation (SPC)*

RAC member, Binod Shrestha, provided an oral report. Shrestha noted the summer outlook load forecast is 3,200 – 3,550 megawatts. Peak load is usually in July. There are scheduled generation outages during off-peak months. There are no gas or coal fuel supply issues. Wind capacity is expected to remain normal around ten percent of installed capacity. SaskPower is expected to meet operating reserve margins during peak and off-peak times.

### *Southwest Power Pool (SPP)*

Scott Aclin, SPP, provided an oral report. Aclin reported that fall and winter were mild, but there were potential coal supply issues in summer and fall. Since the railroads did not strike, the coal plants have returned to healthy supply levels. During Winter Storm Elliot, SPP declared two Energy Emergency



Alerts (EEAs) Level 1 on December 23, 2023. The EEAs were preceded by a cold weather advisory on December 19, 2023. Drivers of the EEAs were generation unavailability, lack of fuel supply, and extreme cold weather outages. SPP's forecast missed load by 2-3 gigawatts in all timeframes during the event. Aclim also noted a summer workshop scheduled for May 11, 2023. Discussion ensued.

## **11. Planning Coordinator Updates**

### *Saskatchewan Power Corporation (SPC)*

RAC member, Binod Shrestha, provided an oral report. Shrestha highlighted a few activities around NERC standards. SPC participated in a joint study with Manitoba Hydro for PRC-006. A benchmark and supplemental assessment are due this year for TPL-007. SPC's anticipated load growth is forecasted to be about one percent. The five year outlook includes several gas/hydro generation projects, including 375 megawatts in wind power plants. The expectation is to add more wind and solar beyond five years. There is also a transmission project under construction between SPP and SPC – adding approximately 140 miles of lines. Shrestha noted a 20 megawatt battery energy storage project that will be operational in early 2024. Discussion ensued.

### *Manitoba Hydro (MH)*

RAC member, Nandaka Jayasekara, provided an oral report. Jayasekara noted the provincial peak load growth is around one percent per year for the next decade. Manitoba Hydro has 36 megawatts of solar PV distributed energy resources (DER), and modest solar growth is anticipated over the next five years. Jayasekara highlighted Manitoba Hydro's Long-Term Transmission Plan and shared the planned expenditures by region and investment category. Key interconnection projects that Manitoba Hydro has committed to were reviewed in addition to a few multi-regional projects not committed to yet. Jayasekara provided an overview of Manitoba Hydro's transmission assessment process.

Jayasekara shared an update on FERC Order 881 implementation plans and Manitoba Hydro's first Integrated Resource Plan (IRP) which is expected to be published in summer 2023. The IRP includes natural gas and electricity resources and infrastructure including generation, transmission, distribution and non-wires solutions.

## **12. MRO Regional Risk Assessment (RRA)**

MRO Principal Technical Advisor, Mark Tiemeier, provided an overview of the MRO 2023 Regional Risk Assessment (RRA). Tiemeier noted that the RRA was published on February 6, 2023 and highlighted the upcoming webinar on March 8, 2023. Tiemeier explained the purpose of the risk assessment tool and the reason MRO conducts the regional risk assessment every year. The infographic was also reviewed which recaps the MRO Reliability Risk Matrix risk rankings and key findings from the RRA. Tiemeier gave an overview of the top reliability risks to the MRO region. Discussion ensued.

## **13. NERC Standards Review Forum Update**

There was nothing to report on behalf of the NERC Standards Review Forum (NSRF).

## **14. Protective Relay Subgroup Update**

MRO Senior Systems Protection Engineer, Jake Bernhagen, provided an update on behalf of the Protective Relay Subgroup (PRS). Bernhagen highlighted items for the upcoming first quarter meeting scheduled for March 14, 2023. Jack Norris, NERC will be presenting on a new misoperations metric



and Rich Bauer, NERC will present on FERC Order 881. Bernhagen also noted an ERO-wide misoperations workshop that NERC is planning to host in fall 2023.

#### **15. 2023 Meeting Dates**

Chair Pursley reviewed the 2023 meeting dates for the RAC, as well as the other councils and subgroups.

#### **16. RAC Member Roundtable**

Chair Pursley invited member participants to share other relevant industry observations. Topics discussed included, physical security threats to substations and supply chain issues. A member noted that he has been selected for the NERC SAR Drafting Team for Project 2022-04 EMT Modeling. And a suggestion was made for MRO to include the target audience in event announcements when promoting outreach events.

#### **17. Other Business and Adjourn**

Having no further business to discuss, the meeting was adjourned at 3:02 p.m.

**Prepared by:** Rebecca Schneider, Reliability Analysis Administrator.

**Reviewed and Submitted by:** Bryan Clark, Director of Reliability Analysis



## Exhibit A – Meeting Attendees

Reliability Advisory Council Members Present	
Name	Organization
Dick Pursley, Chair	Great River Energy
Andy Witmeier	MISO
Binod Shrestha	Saskatchewan Power Corporation
Bryn Wilson	Oklahoma Gas & Electric
Dallas Rowley	Oklahoma Gas & Electric
Dwayne Stradford	American Electric Power
Jason Weiers	Otter Tail Power Company
Jeremy Severson	Basin Electric Power Cooperative
John Stephens	City Utilities of Springfield Missouri
Nandaka Jayasekara	Manitoba Hydro
Ron Gunderson	Nebraska Public Power District
MRO Staff Present	
Name	Title
Bryan Clark	Director of Reliability Analysis
Rebecca Schneider	Reliability Analysis Administrator
Lisa Stellmaker	Executive Administrator
Mark Tiemeier	Principal Technical Advisor
Salva Andiappan	Principal Reliability Assessment Engineer
Jake Bernhagen	Senior Systems Protection Engineer
Cris Zimmerman	Manager of Outreach and Stakeholder Engagement
Steen Fjalstad	Director of Security
Lee Felter	Principal Security Engineer
Lauren Mcclary	Meeting Administrator



Joshua Hebert	Senior Compliance Auditor, O&P
Other Attendees	
Name	Organization
Wayne Guttormson	Saskatchewan Power Corporation
Jaimin Patel	Saskatchewan Power Corporation
Lynn Schroeder	Sunflower Electric Power Corporation
Tom Whynot	Manitoba Hydro
John Roemen	Western Area Power Administration
Scott Aclin	Southwest Power Pool
Daryl Maxwell	Manitoba Hydro
Andrew Coffelt	Kansas City Board of Public Utilities
Jessica Burdette	MN Department of Commerce
Richard Bou	Xcel Energy
Shawna Satterwhite	Oklahoma Gas & Electric
Austin Towne	Western Farmers Electric Cooperative
Tina Adams	Western Farmers Electric Cooperative
Daniel Moore	Western Farmers Electric Cooperative
Jeremy Harris	Evergy
Mary Agnes Nimis	FERC
Neil Smith	Corn Belt Power Cooperative
Dan Weger	Evergy
Nazra Gladu	Manitoba Hydro





## Reliability Advisory Council Charter

*January 1, 2023*

### I. Purpose

The MRO Reliability Advisory Council (MRO RAC) provides advice and counsel to MRO's Board of Directors (board), the board's Organizational Group Oversight Committee (OGOC), staff, members and registered entities on topics such as transmission adequacy and availability, energy and resource adequacy, integration of renewables, essential reliability services, event analysis, system protection, and reliability assessments. The MRO RAC seeks to increase outreach and awareness in these key areas.

### II. Membership

The MRO RAC is comprised of 15 members which will include a member from each Reliability Coordinator (RC) and Planning Coordinator (PC) in the MRO Region. If an entity is registered as both an RC and a PC, one member may represent both the RC and the PC. All Council members will have a three-year term. Nominations for open positions on the MRO RAC will be submitted to the MRO RAC for review. The MRO RAC, with input from MRO staff, will recommend the candidate(s) best suited for the open position(s) based on experience, expertise and geographic diversity to the board's OGOC, which will appoint the members of the MRO RAC.

Pursuant to [Policy and Procedure 3 – Establishment, Responsibilities, and Procedures of Organizational Groups and MRO Sponsored Representatives on NERC Organizational Groups](#), membership on councils is based on experience and expertise. No more than two members of the council may be an employee of a single entity or affiliated entities. At least three sectors will be represented on the council. To the extent practicable, membership will reflect geographic diversity and balanced sector representation. MRO staff will solicit volunteers from MRO Members.

Individuals with expertise and experience in the areas of transmission planning, resource planning, power systems engineering, system operations, as well as control and protection systems serve on the MRO RAC.

The MRO RAC will annually elect its chair and vice chair pursuant to the process and terms outlined in Policy and Procedure 3.

### III. Key Objectives and Responsibilities

Key objectives and responsibilities of the MRO RAC include:

- Annually develop a work plan in coordination with MRO staff to support the MRO Strategic Plan and Metrics for approval by the OGOC and report performance progress.
- Review performance against established metrics and suggest additional metrics to identify areas of risk or reliability improvement.
- Serve as subject matter experts for MRO registered entities, members, other organizational groups, staff, as well as the board and its committees.
- Maintain awareness of work by industry, NERC and other Regional Entity organizational

*Approved by the MRO OGOC: June 22, 2022*





groups to avoid or minimize duplicative efforts and to partner and coordinate where appropriate.

- Recommend the establishment of subgroups to support the RAC work plan as appropriate. Oversee and provide direction to any subgroups.
- Support the preparation of special assessments and seasonal readiness plans by regional Reliability Coordinators and as may be directed by NERC or the MRO Board of Directors from time to time.
- Review and assess the overall reliability of the MRO region and interregional bulk electric system for long-term planning horizons based on reports from regional Planning Coordinators as directed by NERC or the MRO Board of Directors from time to time.
- Support the development of the annual MRO Regional Risk Assessment by identifying risks, trends, and mitigating activities.
- Review significant BES events (generally, Category 2 or higher) which occurred in the MRO Region and the resulting reports and approve larger scale event reports (Category 3 and higher) to assure the appropriate analysis is performed and that any lessons learned are identified and shared with the industry.
- Provide input and guidance on system protection and control matters, including Reliability Standards development, misoperation reviews, and reviews of remedial action schemes.
- Conduct outreach and awareness to increase reliability and decrease risk to the reliable and secure operations of the bulk power system:
  - Facilitate and lead the design of the Annual MRO Reliability Conference(s). Present at conference(s) as appropriate.
  - Support Midwest Reliability Matters by writing articles.
  - Share best practices via webinars.
  - Collaborate with the Transmission and Generator Forums, the Eastern Interconnection Planning Collaborative and others to share information
- Develop a Highly Effective Reliability Organization® (HERO) outreach effort to help registered entities assess and improve their own reliability practices.
- Recommend individuals to represent MRO as representatives on NERC organizational groups to the OGOC.
- Provide guidance and communicate expectations to MRO NERC representatives, receive reports from MRO NERC representatives, and disseminate the information as directed by the board's OGOC.
- Support the applicable NERC program areas.
- Annually review the charter and propose changes as needed to the OGOC.

## IV. Meetings

The MRO RAC will meet quarterly or as necessary, in person or via conference call and/or web meeting.

All MRO council chairs and vice chairs will meet with the OGOC the day before the fourth quarter regularly scheduled board meeting to review the council's accomplishments during the past year and to develop work plans for the following year.

Meetings of the MRO RAC are open to public attendance; however, the meeting may be called into closed

*Approved by the MRO OGOC: June 22, 2022*



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session by the chair or vice chair. Additional meeting requirements related to agendas and minutes, voting and proxy, and rules of conduct are outlined in MRO Policy and Procedure 3.

## **V. Costs**

Meeting costs incurred by MRO RAC members are reimbursable by MRO according to MRO Policy and Procedure 2–Expense Reimbursement.

## **VI. Reporting Requirements**

The chair or vice chair of the MRO RAC will provide a report to the OGOC during their fourth quarter meeting reviewing past accomplishments and highlighting work for the coming year. During the other quarterly meetings of the OGOC, the chair, vice chair, or other designee of the MRO RAC will provide a written or oral report to the OGOC.

*Approved by the MRO OGOC: June 22, 2022*



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## MRO PROTECTIVE RELAY SUBGROUP CHARTER

*January 1, 2023*

### I. Purpose

The purpose of the MRO Protective Relay Subgroup (PRS) is to identify, review and discuss system protection and control issues relevant to the reliability of the bulk electric system and to develop and implement regional procedures for applicable NERC PRC standards. The PRS reports to the Reliability Advisory Council (RAC).

### II. Membership

Pursuant to [Policy and Procedure 3: Establishment, Responsibilities, and Procedures of Organizational Groups and MRO Sponsored Representatives on NERC Organizational Groups](#) (PP3), membership of organizational groups shall be determined based upon experience, expertise and geographic diversity and to the extent practicable, shall include a balanced representation of the sectors. The PRS is comprised of industry experts in the areas of system protection and control. The specific experience and expertise needs of the PRS are determined by the PRS. The subgroup shall be comprised of no more than 19 members, with not more than one member from the same company.

The PRS will annually elect its chair and vice chair pursuant to the process and terms outlined in Policy and Procedure 3.

### III. Key Objectives

- Develop, maintain, and implement regional procedures as needed that address the requirements of NERC PRC standards.
- Annually review the summary of Misoperations (prepared by MRO staff) for the purpose of identifying Lessons Learned and communicating these lessons with MRO membership.
- Trend the Event Analysis reports submitted to MRO for the purpose of identifying misoperations that are causing, or increasing the severity of, these events. Through the PRS, work with the Entities involved with these events to assure that the misoperations are effectively identified and mitigated. Assure that any protection-related Lessons Learned of value to the industry are prepared and submitted to NERC Event Analysis staff.
- Prepare as necessary additional reports/whitepapers that identify methods that can reduce the likelihood or severity of system events or misoperations that can lead to system events.
- Review Remedial Action Schemes (RAS) as necessary to verify protection system functionality and/or assess operability.
- Provide technical input related to system protection and control to MRO.
- Interface with the NERC groups related to protection and control.

### IV. Meetings

The PRS will meet quarterly, or as necessary, in person, via conference call, or web meeting. Meetings of the PRS are open to public attendance; however, an executive session may be called by the chair or vice-chair. Additional meeting requirements related to agendas and minutes, voting and proxy, and rules of conduct are outlined in MRO Policy and Procedure 3, Organizational Groups.

*Approved by the MRO OGOC: April 6, 2022*



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## **V. Costs**

Meeting costs incurred by PRS members are reimbursable by MRO according to MRO Policy and Procedure 2, Expense Reimbursement.

## **VI. Reporting Requirements**

The chair of the PRS, or delegate, will provide a written or oral report describing the activities and actions of the group quarterly to the RAC. The PRS will perform an annual review of this charter and the group's overall purpose and key objectives to ensure that the group is efficient and effective in its operations and according to its purpose. The chair will provide an annual summary report, including a statement of its conclusions, to the RAC.

*Approved by the MRO OGOC: April 6, 2022*

## AGENDA

**MRO Board of Directors, OGOC and General Update**  
*Bryan Clark, Director of Reliability Analysis, MRO*

### Action

Information

### Report

Bryan Clark will lead this discussion during the meeting.

**Classification: Public**



MIDWEST  
RELIABILITY  
ORGANIZATION

# OGOC and BOD Update

Bryan Clark, P.E.  
Director of Reliability Analysis  
May 18, 2023

CLARITY

ASSURANCE

RESULTS

# OGOC Q1 Meeting Summary

- **HERO Award Changes**
- **2023 Work Plan Approved**
- **Insider Threat Risk Discussion**



# Joint Council Meeting

- **Q2 OGOC Meeting Risk Roundtable**
  - June 14, 2023
  - ***Energy Reliability Planning***





# Future Meeting Dates

- **Q2 OGOC Meeting**
  - June 14, 2023
- **Q2 BOD Meeting**
  - June 15, 2023
- **Q3 OGOC Meeting**
  - September 13, 2023
- **Q3 BOD Meeting**
  - September 14, 2023





# Questions

## AGENDA

### 2023 Reliability Conference Debrief *Bryn Wilson, Reliability Advisory Council Member*

#### Action

Discussion

#### Report

Bryn Wilson will lead this discussion during the meeting.

Classification: **Public**

## AGENDA

### Reliability and Security Technical Committee (RSTC) Update *John Stephens, Reliability Advisory Council and RSTC Member*

#### Action

Information

#### Report

John Stephens will provide an oral report during the meeting.

Classification: **Public**

## AGENDA

### MRO Representatives on NERC Subgroups – Written Reports

- a. NERC Electric Gas Working Group (EGWG)  
*Jaimin Patel, SaskPower*

#### Action

Information

#### Report

Since the last RAC meeting, the EGWG had WebEx meeting on March 9, 2023. The last [meeting agenda](#) is posted on the [NERC website](#). Future meeting date/time is included in the meeting agenda.

Following is a summary of EGWG activity.

#### Areas of Focus

- **Discussion on Revising the Fuel Assurance Guideline**
  - Created a sub-team to revise the existing Reliability Guideline.
  - Tentative sub-team meeting schedule was discussed to have working draft due to EGWG by May 11 i.e. before the next EGWG team meeting on May 25.
  - Target to complete by September 2023.
- **NAESB Gas-Electric Harmonization Forum Update**
  - Refer to below link to follow this forum activities/updates/meetings.  
[NAESB Gas-Electric Harmonization Forum](#)
  - NAESB had Gas Electric Harmonization (GEH) forum survey out.
  - Survey included to provide priority on recommendations.
  - Over 30 responses were received on GEH forum survey.
  - Information on survey/response can be found at the above link.

#### Accomplishments

- None identified for this report.

#### Challenges

- None identified for this report.

Please provide any comment/feedback/follow-up question regarding above summary.

**AGENDA**

**MRO Representatives on NERC Subgroups – Written Reports**

b. NERC Inverter-Based Resource Performance Subcommittee (IRPS)

*Open*

**Action**

Information

**No Report**

## AGENDA

### MRO Representatives on NERC Subgroups – Written Reports

- c. NERC System Planning Impacts from DER Working Group (SPIDERWG)  
*Wayne Guttormson, SaskPower*

### Action

Information

### Report

Last SPIDERWG meeting was held on May 1<sup>st</sup> and 2<sup>nd</sup>. Meeting was virtual and covered the following coordination and analysis sub-group activities of the working group.

- Agenda packages and minutes are posted on SPIDERWG site ([System Planning Impacts from DER Working Group \(SPIDERWG\) \(nerc.com\)](#)).
- SPIDERWG work plan posted at [Report \(nerc.com\)](#)
- RTSC strategic plan posted at [Report \(nerc.com\)](#)
- RSTC work plan posted at <https://www.nerc.com/comm/RSTC/Documents/RSTC-Work-Plan.xlsx>

### General Activities:

- Work plan Review
- Presentations on *Collaborative Non-Profit DER Registry Briefing* and *Bottom-up Grid Modeling for Distribution Operations and Planning*.

### Coordination Activities:

- Standards Committee Engagement
  - o Engagement with ongoing Standards Projects from SARs that originated from SPIDERWG work (Project 2022-02 for TPL-001 and MOD-032 SARs)
- White Paper Update: Security Risks Posed by DER and DER Aggregator
  - o joint work with SITES
  - o Submitting for internal (RSTC, SITES, SWG) and external (NREL & EPRI) review.
- White Paper Update: Variability, Uncertainty, and Data Collection for the BPS with DER Aggregators
  - o Review of internal survey and re-release for updated responses.
- Proposed SARs Update:
  - EOP-004 – Reporting of aggregate DER loss during events
    - Collaborating with NERC PAS and EAS
  - EOP-005 – Telemetry requirements for DERs and/or DPs
    - Collaborating with NERC RTOS and EAS
  - o Work on lower priority SAR's continuing:
    - BAL-003, PRC-006, TOP-001, -002, -003, and -010

### Analysis Activities:

- Guideline Final Review: DER Data Collection and Model Verification for Aggregate DER
- Guideline Review Update: BPS Planning Practices under Increasing Penetrations of DER

**Classification: Public**

**Next meeting:**

- Scheduled for August 1<sup>st</sup> and 2<sup>nd</sup> may be held at the NPCC offices or virtually. Additional meeting dates scheduled for 2023 are October 24<sup>th</sup> and 25<sup>th</sup>, may be held at the NERC offices or virtually.

**Areas of Focus**

Following work plan deliverables are being submitted for RSTC action at the June 2023 meeting.

- SAR for revisions to MOD-031 – for **Endorsement**
- SARs for revisions to EOP-004 and 005 – for **Review**
- Reliability Guideline Update: DER Data Collection and Model Verification of Aggregate DER – for **Approval**
- Whitepaper: Security Risks Posed by DER and DER Aggregators – for **Review**

**Accomplishments**

- SAR's: FAC-001 & FAC-002 – **Endorsed** at March 2023 RSTC meeting.
- Reliability Guideline: BPS Perspectives on the Adoption of 1547-2018 – **Approved** at March 2023 RSTC meeting.

**Challenges**

- Completing RSTC strategic plan deliverables for DER risks.



## AGENDA

### MRO Representatives on NERC Subgroups – Written Reports

- d. NERC System Protection and Control Working Group (SPCWG)  
*Lynn Schroeder, Sunflower Electric Power Corporation*

#### Action

Information

#### Report

##### Areas of Focus

1. Development of position paper related to FERC order 881 to determine if there may be impacts to PRC-023. The final draft was approved by SPCWG in April. The next step is finalization by the NERC technical writers and then onto the RSTC for acceptance expected as part of their June meeting. The industry has questions related to the margin that may be required above an AAR rating. Associated setting modifications are likely if large margins, such as 150% above maximum AAR ratings, are required; however, setting modifications are significantly less likely to be required if lower margins above maximum AAR ratings are acceptable. Lower margins will alleviate unnecessary costs to the industry, while still ensuring that relays will not trip in the rare event that load increases to maximum AAR levels.
  - FINAL SPCWG DRAFT includes - “In conclusion, it is SPCWG’s position that no changes to PRC-023 are necessary and protection systems that are presently applicable and compliant with PRC-023 based on winter seasonal ratings do not need to be set to meet the margin required in PRC-023 for the AAR that are determined by the entities (Order 881-A, P24 above). SPCWG does recommend that entities review loadabilities for all Protection Systems applicable to transmission lines which fall under the orders, including those to which PRC-023 applies, to ensure that there is a sufficient margin above anticipated normal and emergency AAR. If the intent of FERC 881/881A is for industry to reach the margins specified in the chosen criteria of PRC-023 to be maintained for AAR produced ratings, then the expected necessary implementation timeframe would be consistent with the initial implementation timeframe for PRC-023.”
2. Technical Reference related to maintenance for Ethernet based P&C. With changes in technology, there is a need to review NERC Standards and how maintenance for Ethernet based P&C systems fit into those standards. The SPCWG is developing a Technical Reference Document to provide industry guidance for impacts of systems such as 61850 architectures on NERC Protection System definition and related standards. The team is in the beginning phase of writing assignments.
3. Review of “Determination of Practical Transmission Relaying Loadability Settings” IG. SPCWG final review is complete. The next step is finalization by the NERC technical writers and then onto the RSTC for acceptance expected as part of their September meeting. This is a minor revision to the IG bringing it up to date with the PRC-023-5 version of the standard, and includes recommendations from the PRC-023 SDT to Appendix C.
4. Review of “Transmission System Phase Backup Protection” document. SPCWG has asked

## MEETING AGENDA – Reliability Advisory Council (RAC) – May 18, 2023

for direction from NERC to determine if this document can be maintained for industry as a “historical” TR. The original technical information is useful; however, terminology and references are tied to the date of publish (+10 years ago). Bringing it up to date would take significant effort with little technical benefit.

5. Reliability Assessment Subcommittee (RAS) has requested SPCWG feedback. Specifically, items that may be pertinent to the Long-Term Reliability Assessment (LTRA) such as IBR responses to fault current and impacts to protection.

### **Accomplishments (Limit to 3-5 points)**

- Final draft SPCWG 881/881A position paper (see above details).
- Final review of minor revision to “Determination of Practical Transmission Relaying Loadability Settings” IG (see above details).
- Lynn Schroeder has been elevated to chair of SPCWG and Manish Patel is the new vice-chair.

### **Challenges**

1. Increased IBR across the grid and their impacts to system protection, such as modeling and injection characteristics during fault conditions. Continued liaison with IRPS, IEEE PRSC, NERC RAS and further involvement with SPIDERWG to assist in identification and solutions of protection related IBR challenges.

SPCWG and Subgroup Meeting Dates	Time (Eastern Prevailing Time)	Location
April 12-13, 2023	8-5 pm, 8-noon	SERC offices Charlotte NC
June 12, 2023	8:00 a.m. – 5 p.m.	PJM/Webex – EAS
June 13, 2023	8:00 a.m. – noon	PJM/Webex – EMSWG
June 13, 2023	1:00 – 5:00 p.m.	PJM/Webex – SPCWG
August 10, 2023	1:00 – 5:00 p.m.	WebEx
October 24, 2023	8-5 pm, 8-noon	Atlanta
October 25-26		misoperations workshop
December 14, 2023	1:00 – 4:00 p.m.	WebEx

Classification: **Public**

## AGENDA

### MRO Representatives on NERC Subgroups – Written Reports

- e. NERC Energy Reliability Assessment Task Force (ERATF)  
*Tom Whynot, Manitoba Hydro*

### Action

Information

### Report

The following is a status of the NERC ERATF subgroup for the RAC.

- Following the March 23<sup>rd</sup> report, the draft version of Volume 1 of the ERATF white paper has been published with no notable changes. It identifies the need for Energy Assessments in addition to Capacity Assessments.
- The topic of energy storage was broached during feedback on the Volume 1 white paper and will be expanded on in Volume 2.
- Volume 2 work will begin in April. It will cover requirements for frequency, timelines, and mitigation criteria for Energy Assessments and may apply conditional requirements for generation types. This topic is a high concern for all stakeholders, a balance must be observed between reliability and the achievable steps for utilities to implement measures. Development and implementation of tools (EPRI), processes, and methods for energy assessments, and the possibility of planning for building capacities of certain generation mix types, or the addition of on-site fuel storage, or the requirement for long-term energy agreements to assure fuel/energy reliability.
- Seeking implementation of both standards by 2025; estimated 18-month timeline to approve standards.
- There possibly will be an EPRI presentation on potential Energy Assessment tools.
- Next scheduled meeting of the ERAWG is May 17, 2023.

## AGENDA

### 2023 Work Plan Update

- a. Review Action Items

*Dick Pursley, Reliability Advisory Council Chair*

### Action

Discussion

### Report

Chair Pursley will lead this discussion during the meeting.

Classification: **Public**

## AGENDA

### Reliability Coordinator Updates

- a. Midcontinent Independent System Operator (MISO)  
*Durgesh Manjure, MISO and RAC Member*

### Action

Information

### Report

Durgesh Manjure will provide an oral report during the meeting.

Classification: **Public**

## AGENDA

### Reliability Coordinator Updates

- b. Saskatchewan Power Corporation (SPC)  
*Binod Shrestha, SPC and RAC Member*

### Action

Information

### Report

Binod Shrestha will provide an oral report during the meeting.

Classification: **Public**

## AGENDA

### Reliability Coordinator Updates

c. Southwest Power Pool (SPP)  
*CJ Brown, SPP and RAC Member*

### Action

Information

### Report

CJ Brown will provide an oral report during the meeting.

Classification: **Public**

## AGENDA

### MRO Regional Summer Assessment (RSA)

*Salva Andiappan, Principal Reliability Assessment Engineer, MRO*

#### Action

Information

#### Report

Salva Andiappan will provide an update during the meeting.

Classification: **Public**





MIDWEST  
RELIABILITY  
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# OVERVIEW OF MRO 2023 REGIONAL SUMMER ASSESSMENT

Salva Andiappan  
Reliability Analysis Department

CLARITY

ASSURANCE

RESULTS

# Key Findings

- **MH, MISO, SPC and SPP have sufficient operating reserve to meet normal forecasted peak load with typical outages.**
- **MISO, SPC and SPP will need to issue EEAs for extreme summer peak load and outages.**
- **MISO and SPP can face challenges in meeting normal or extreme peak load if wind resource output is below normal.**
- **Long term trends indicate increasing generation forced outage rates.**
- **Decreasing transmission forced outage rates between 2020 and 2021 and levelling off in 2022.**
- **Human errors shown to be the primary contributing factor for system protection misoperations.**



# Reserve Margin Percentage under Normal Conditions

Assessment Area	Anticipated Resources	Typical Maintenance and Forced Outages	Anticipated Resources with Typical Outages	Normal Peak Load	Anticipated Reserve Margin with Typical Outages	PRM Requirements
MH	3,950	106	3,844	3,060	<b>25.6%</b>	12.0%
MISO	143,668	21,853	121,815	116,825	<b>4.3%</b>	15.9%
SPC	4,503	568	3,935	3,489	<b>12.8%</b>	15.0%
SPP	65,583	5,450	60,133	52,626	<b>14.3%</b>	19.0%

Anticipated Reserve Margin with Typical Outages and Normal Forecast

- MH, MISO, SPC and SPP have sufficient operating reserve to meet normal forecasted peak load with typical outages.



# Reserve Margin Percentage under Extreme Conditions

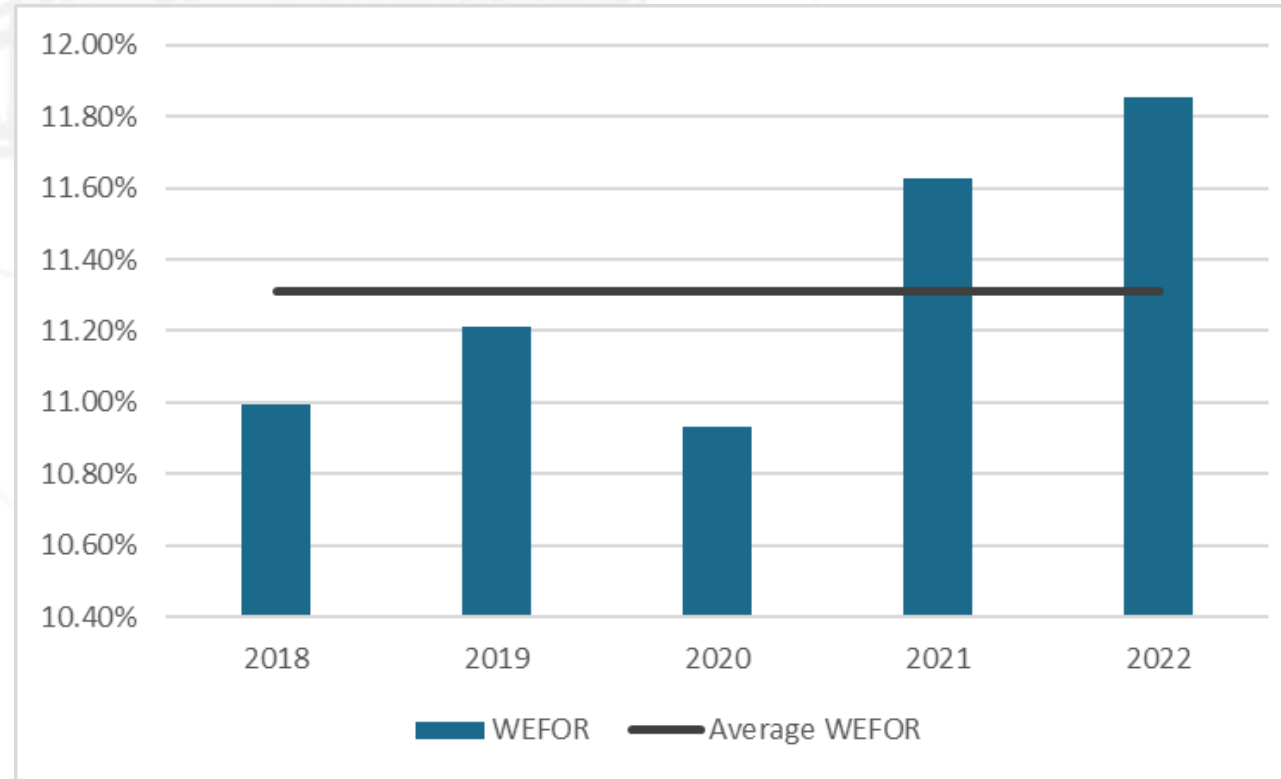
Assessment Area	Extreme Low Generation + Operational Mitigations	Extreme Peak Load	Reserve Margin Under Extreme Conditions	Operating Reserves	Likelihood to issue EEAs
MH	3,834	3,390	+13.1%	150	Low
MISO	115,265	123,871	-6.9%	2,400	High
SPC	3,563	3,633	-1.9%	337	High
SPP	52,937	55,126	-4.0%	2,000	High

Reserve Margin Percentage under Extreme Summer Conditions

- MISO, SPC and SPP will need to issue EEAs for extreme summer peak load and outages.



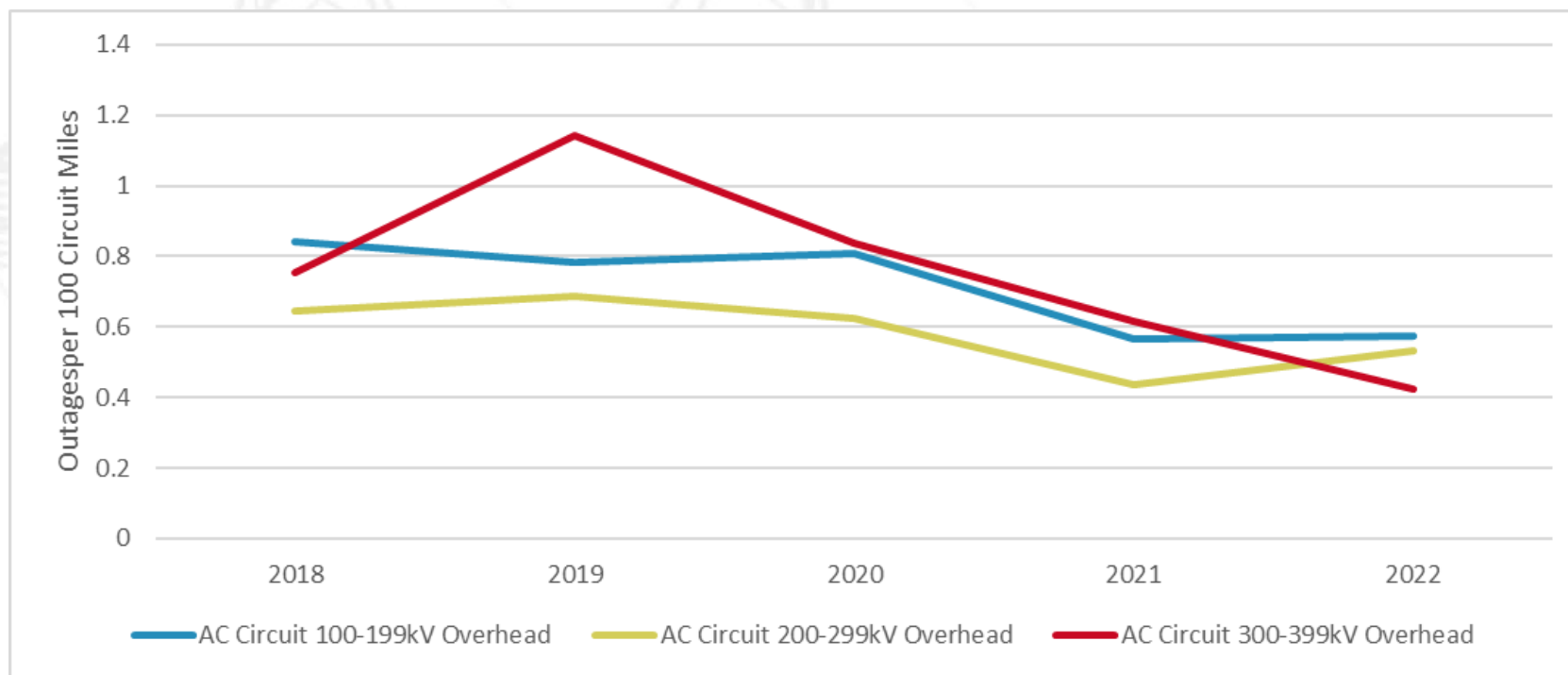
# MRO 5-Year Generator MW-Weighted EFOR



- Long term trends continue to indicate increasing EFOR rates.



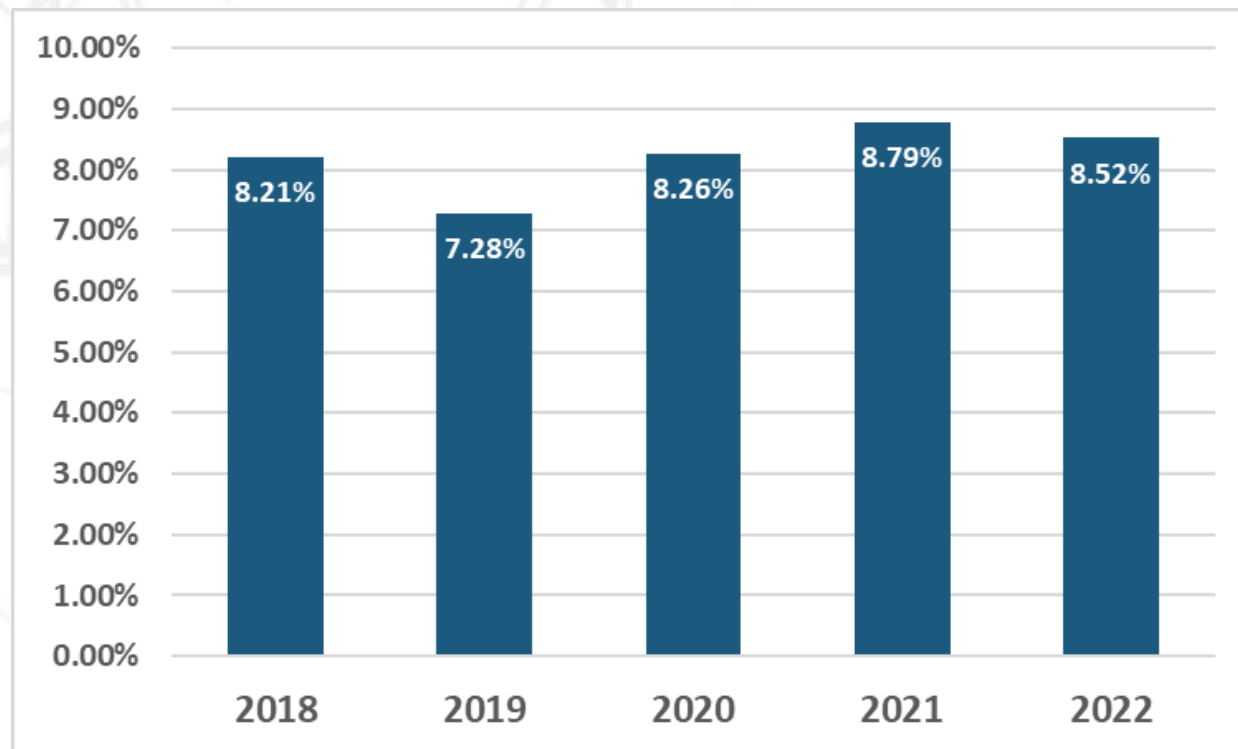
# Annual Summer Total Outages Per 100 Circuit Miles



- Decrease in the yearly outages between 2020 and 2021 and levelling off in 2022



# MRO Misoperation Rates by Year

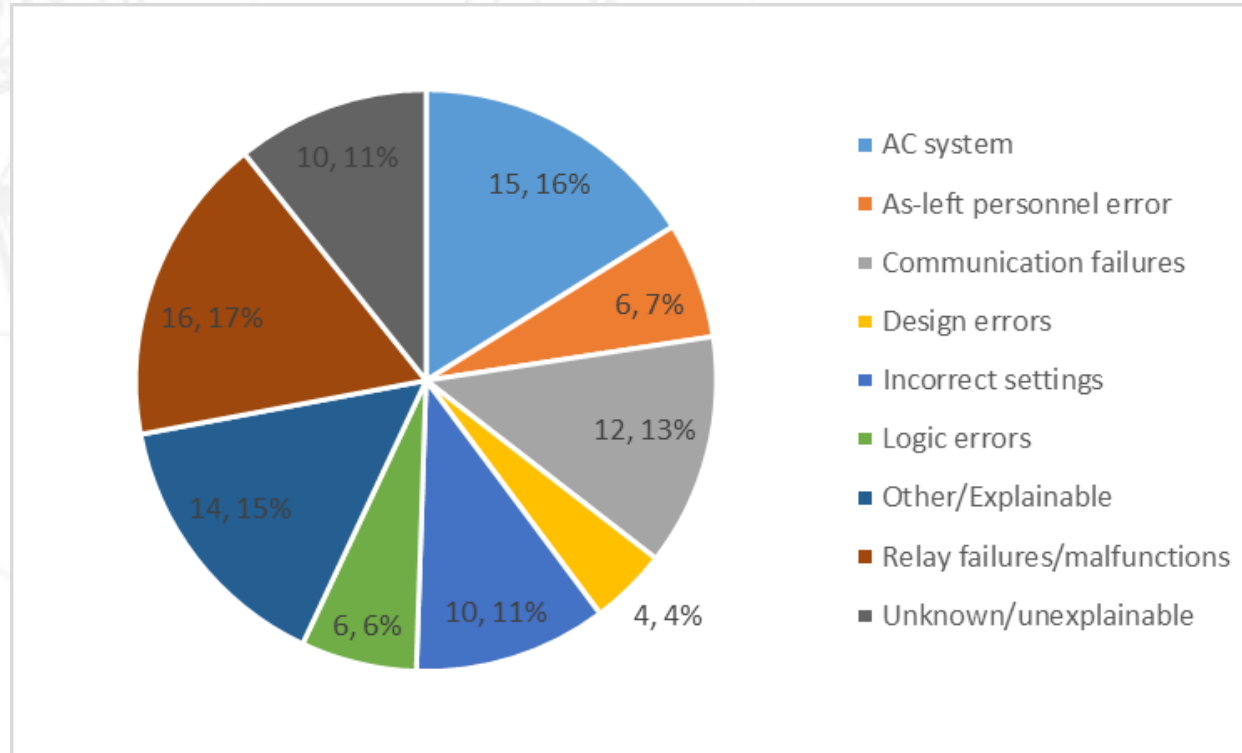


- Upward trend seen in 2020 and 2021 did not continue in 2022.
- Total protection system operations increased about 25 percent and total misoperations increased approximately 22 percent.

**Misoperation Rate = (No. of Misoperations / No. of Total Operations) X 100%**



# Summer 2022 Misoperations by Cause



- 93 misoperations between June 1, 2022 and September 30, 2022.
- Over one-quarter were attributable to human errors.





# Questions



## AGENDA

### Feedback on 2023 Regional Risk Assessment

*Mark Tiemeier, Principal Technical Advisor, MRO*

#### Action

Information

#### Report

Mark Tiemeier will lead this discussion during the meeting.

Classification: **Public**



MIDWEST  
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ORGANIZATION

# MRO 2023 Regional Risk Assessment Feedback

**Mark Tiemeier**

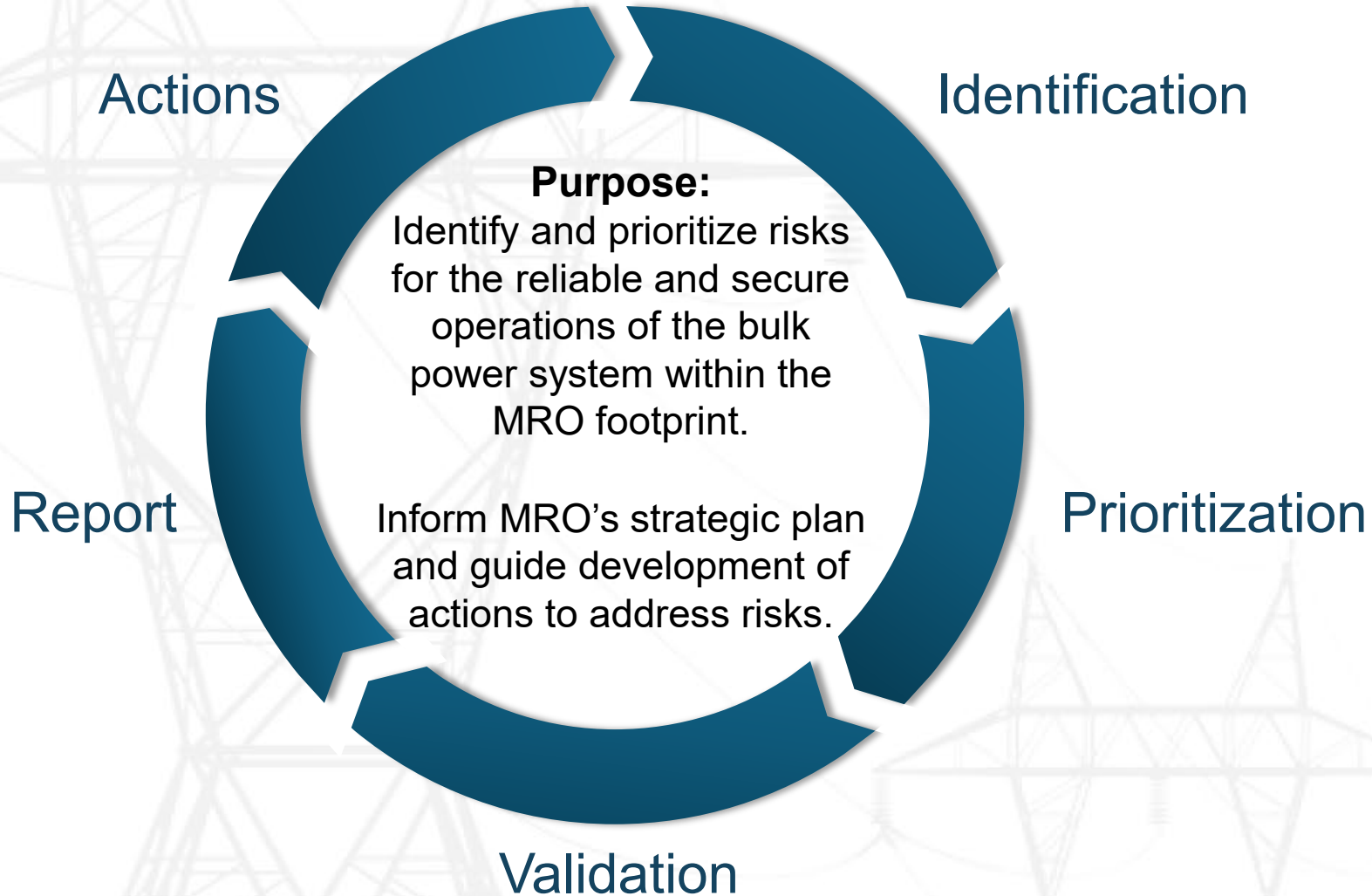
Principal Technical Advisor

CLARITY

ASSURANCE

RESULTS

# Regional Risk Assessment Process

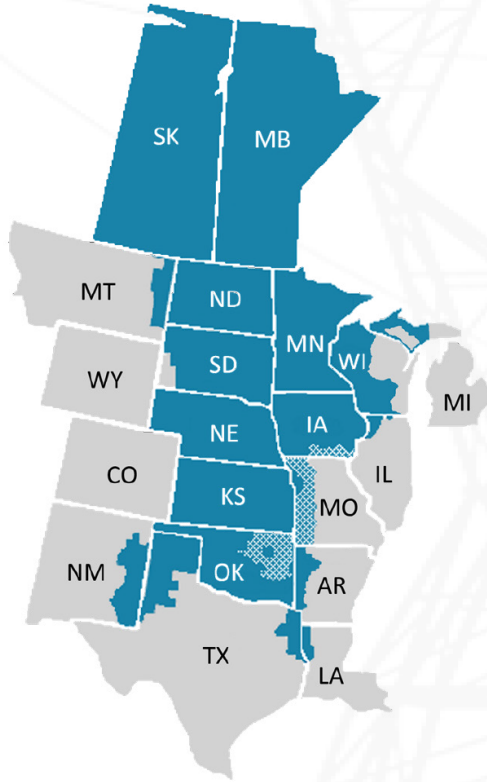




# MRO 2023 Regional Risk Assessment

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

## Territory



## 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](http://www.MRO.net)

## MRO Reliability Risk Matrix: Risk Rankings

Consequence / Impact (C)		Likelihood (L)					
		L1	L2	L3	L4	L5	
		Very Unlikely	Unlikely	Possible	Likely	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			

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

## 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](#)**

## Applicable Reliability and Security Risks

### High Regional Risks

HIGH

1. Bulk Power Model Assumption Accuracy
4. Conservative Practices to Calculate PRM
5. Energy Reliability Planning
6. Generation Unavailability During Extreme Cold Weather
9. Insider Threat
12. Overhead Transmission Line Ratings
13. Phishing/Malware/Ransomware
16. Supply Chain Compromise

### Medium Regional Risks

MEDIUM

2. Changing Sources of Reactive Power
3. Compromise of Sensitive Information (NEW)
7. Inadequate IBR Ride-Through Capability
8. Increased Penetration of Internet-Connected Devices (NEW)
10. Material and Equipment Availability (NEW)
14. Physical Security Protections from Incidents
15. Tightening Supply of Expert Labor
17. Vulnerabilities of Unpatched Systems

### Low Regional Risks

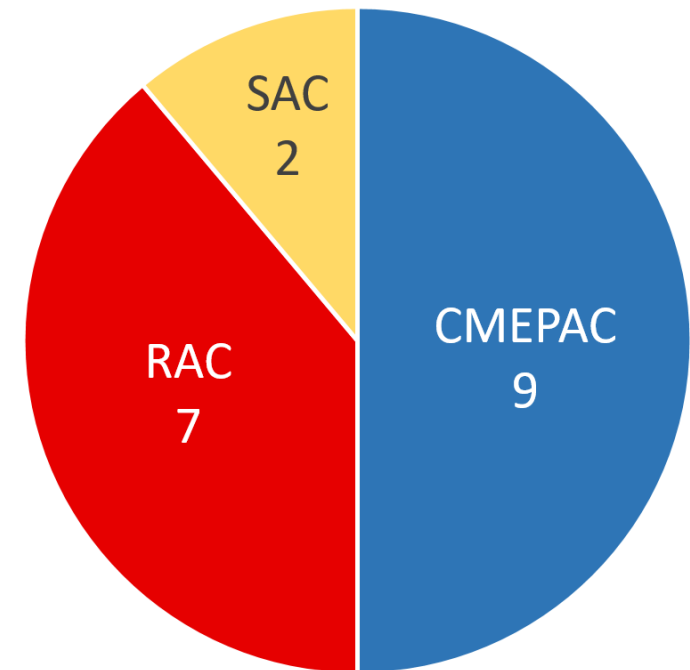
LOW

11. Misoperations Due to Human Errors

# RRA Feedback Survey

- Gather council feedback on 2023 RRA results
- Understand how RRA is used by council member companies
- Seek enhancements for RRA process and 2024 RRA

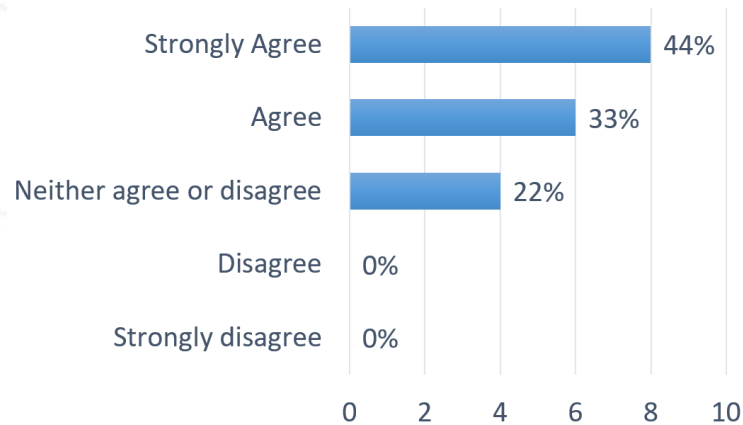
Respondents





# 2023 RRA High Risk Survey Results

## Energy Reliability Planning

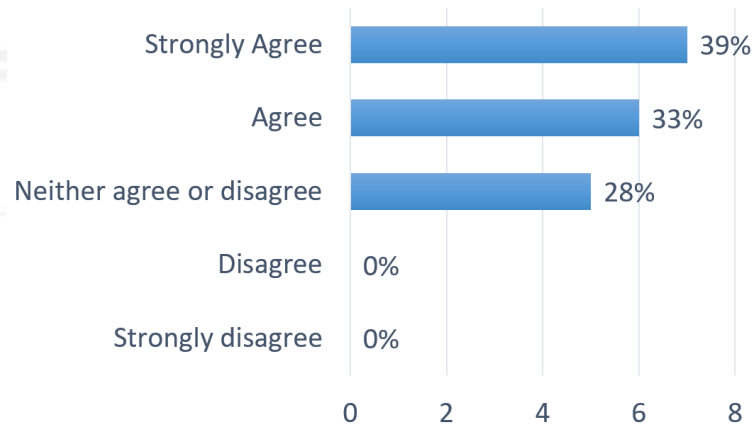


### Comments

This identified risk appears to be an impact from the root causes of “Changing Sources of Reactive Power” & “Generation Unavailability During Extreme Cold Weather”

Concerned about velocity of changes and aggregation affects

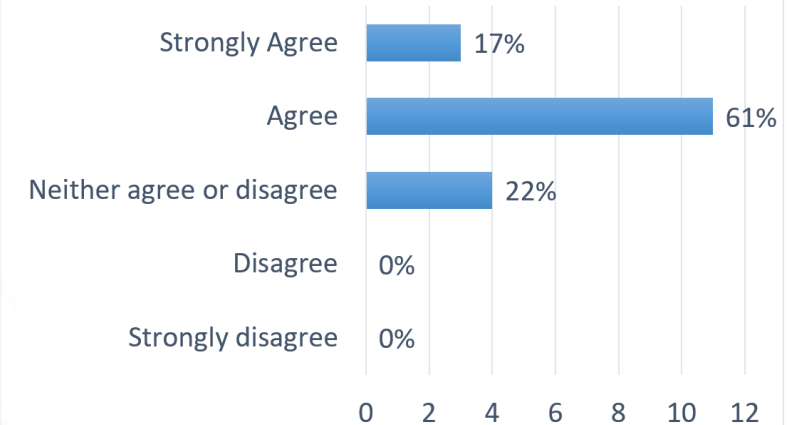
## Conservative Practices to Calculate PRM



### Comments

This identified risk appears to be an impact from the root causes of “Changing Sources of Reactive Power” & “Generation Unavailability During Extreme Cold Weather”

## Bulk Power Model Assumption Accuracy



### Comments

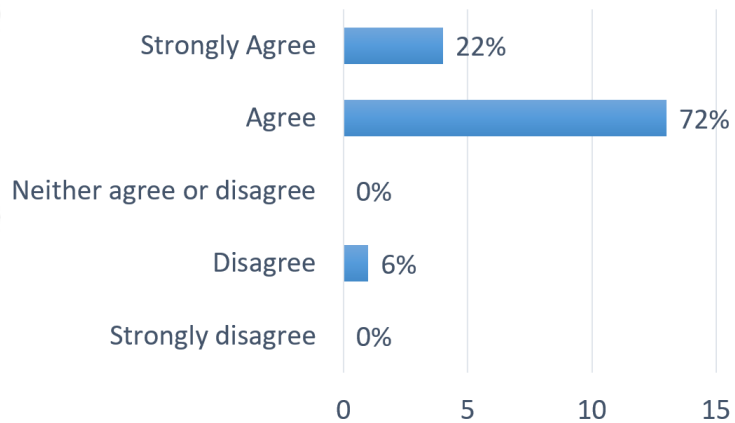
This identified risk appears to be an impact from the root cause of “Changing Sources of Reactive Power”

Concerned about velocity of changes and aggregation affects



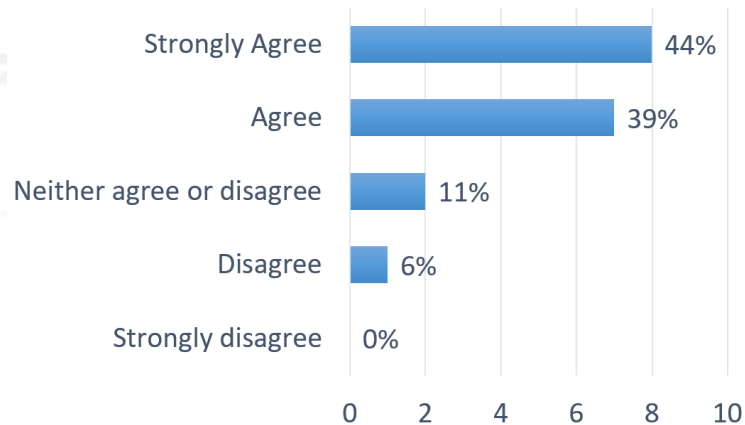
# 2023 RRA High Risk Survey Results

## Supply Chain Compromise



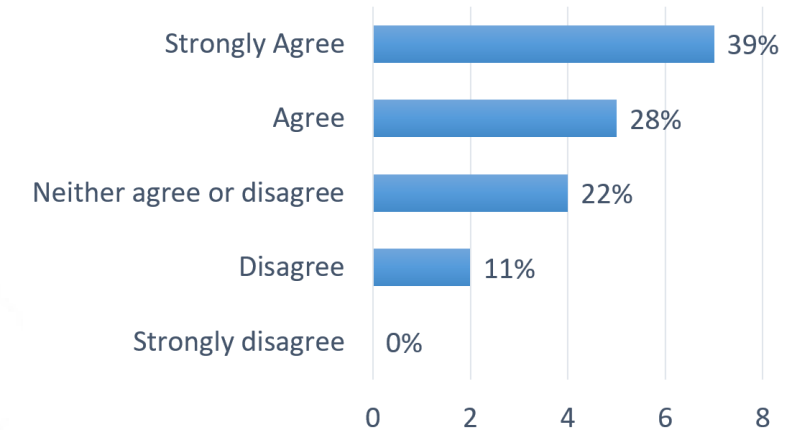
Comments

## Phishing / Malware / Ransomware



Comments

## Insider Threat



Comments

This also potentially exists with physical security as evidenced by recent events.

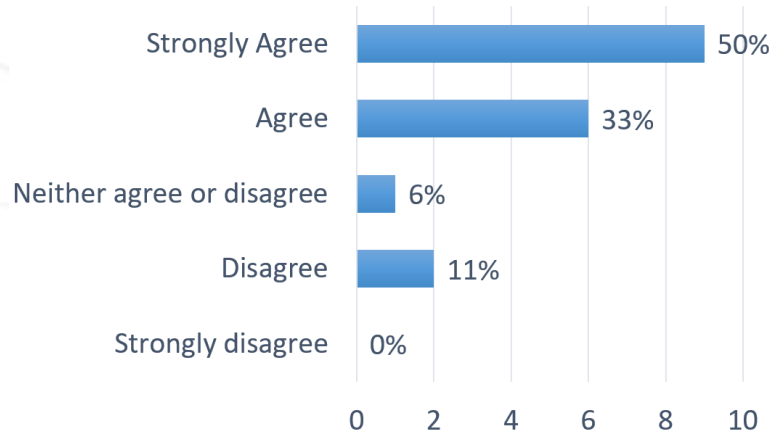
I haven't heard about very many breaches or events related to Insider Threat. Although that has occurred on the rare occasion it doesn't rise to the level of High Priority. There simply aren't enough events to justify this ranking.





# 2023 RRA High Risk Survey Results

## Generation Unavailability During Extreme Cold Weather



### Comments

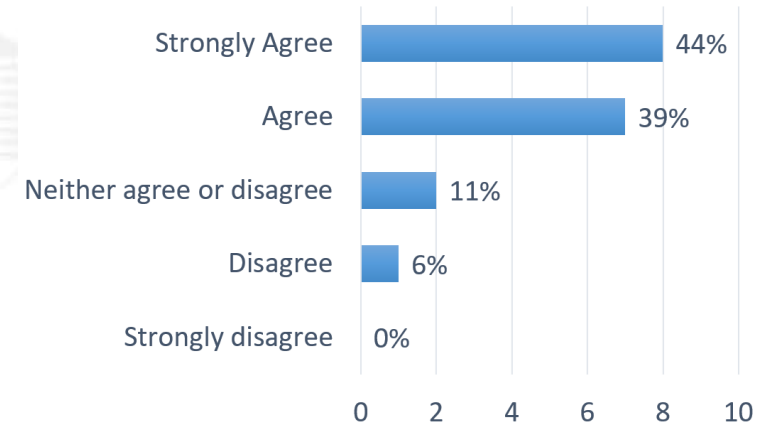
Winter is nothing new in the north. Maybe more of an issue for resources in the southern part of the system and then dealing with transmission constraints.

Also a considerable risk during shoulder seasons when units are down for maintenance.

NERC Standards are being developed to help mitigate this risk.

Is somewhat dependent on location of the resource

## Overhead Transmission Line Ratings



### Comments

Concerned about velocity of changes and aggregation affects

How are facility ratings a high risk when most of the recent FAC-008 violations are being processed as low risk?

I agree with this being a problem, and ambient adjusted ratings being overly complicated. I don't know how large of a risk it is. Has this been or is it expected to be the critical element? Is generation capability more of the concern?



# 2023 RRA High Risk Survey Results

## Should any of the Low or Medium risks been categorized as High in the 2023 RRA?

- This is difficult to assess since the RRA does not provide a distinct listing of high, medium, or low risks.
- Supply Chain - material and equipment availability
- Material and Equipment Availability is becoming critical to maintain reliability. Recovery from a major storm will take much longer with the lack of availability of major material items.
- Changes sources of reactive power is a high risk given the generation transformation underway.
- If "Changing Sources of Reactive Power" was changed to "Changing Mix of Power Sources", this would cover more of the risks and should be high impact.

# 2023 RRA Risk Descriptions Survey Results

**Are there risk descriptions in the 2023 RRA that are inaccurate or unclear?**

- If "Changing Sources of Reactive Power" was changed to "Changing Mix of Power Sources", this would cover more of the risks and should be high impact.

# 2023 RRA Risk Descriptions

## Survey Results

### Any unnecessary overlap in identified risks within the 2023 RRA?

- If "Changing Sources of Reactive Power" was changed to "Changing Mix of Power Sources", this would cover more of the risks and should be high impact.
- Not sure there is unnecessary overlap; however, these risks impact one another such that aggregated might result in different results.
- No unnecessary overlaps in the identified risks
- None identified
- None come to mind.

# Potential 2024 RRA Risks

## Survey Results

### Are there any risks not identified in the 2023 RRA that should be considered for the 2024 RRA?

- I think we should retain the risk "Bulk Power Model Assumption Accuracy" for next year and stress the need to have requirements in the interconnection process to have accurate models which include EMT models to support simulation studies. There are a number of NERC standard developments in progress to address the need for EMT studies and to support PCs and TPs having EMT models from GOs and developers (especially for IBR interconnections).
- The pace of electrification coupled with the retirement of conventional generation resources .
- I believe we have a great list.
- Interdependencies of critical infrastructure (ie electricity's dependency on pipelines for natural gas)
- Loss of Major Transmission Equipment with Extended Lead Times - Some correlation with Material and Equipment Availability...

# Organizational Use of RRA Survey Results

## How does your organization use the MRO RRA?

### Compliance Use

- Standard/requirement data is considered when determining what high-risk standards/requirements will be annually reviewed (internally) by our compliance department to close possible compliance gaps and improve our internal processes and procedures.
- We use the MRO RRA as an input to our NERC Risk Assessment.
- We review the RRA with our companies NERC oversight committee. We discuss whether any policy change internal should be incorporated to address these risks or if we feel additional items could be added.
- The NERC Compliance group uses the RRA as an input to the NERC risk assessment.
- It is used in our annual compliance assessment to identify priority for focusing controls and monitoring compliance and identifying areas for internal audits to verify compliance.





# Organizational Use of RRA Survey Results

## How does your organization use the MRO RRA?

### Used to inform needed operational and planning changes

- Our organization reviews the RRA, taking note of any risks that could impact or be impacted by our system, then we discuss preparations and operational adjustments that we may need to make.
- Not all regional reliability risks identified in the current RRA are applicable to our organization. Currently, we are more focused on Overhead Transmission Line Ratings and integrating DERs into our long-term planning assessments. However, security risks are very common in the region and applicable to most entities.
- The T&D group use the RRA as a reference/input when conducting their risk assessment

# Organizational Use of RRA Survey Results

## How does your organization use the MRO RRA?

### Shared with Executives

- Reviewed at the Executive Level.
- The RRA is socialized with Operations at the Executive level.
- We brief the MRO RRA to the C-Suite and strategy team. The teams assign resources and include the RRA in decision making.

### Other

- The MRO RRA is used as reference document
- Communicated to various audiences.
- This year, it was distributed around our organization more than in the past. I'm not sure who other than Compliance actually uses it.





# RRA Process Improvements

## Survey Results

**What suggestions do you have to improve either the RRA process, report, or results?**

### Compliance Use

- Continue to build off current process. Would like CMEPAC to have bigger role with identifying areas of risks that are not covered by Reliability Standards. Consider broader industry survey for risk assessment and review results broadly.
- The CSI has been moved from this report to the CMEP Summary Report. Although I see the value in this, consolidating this type of information into a single report would be preferable. There are already so many different sources/reports and it easy to overlook important statistics/publications.

# RRA Process Improvements

## Survey Results

### What suggestions do you have to improve either the RRA process, report, or results?

#### Risk identification and ranking improvements

- As someone who participated in the RRA process for the first time, I had absolutely no idea what the process was until I was involved in it. Being a part of the process gave the process a lot more credibility to me. I think it would be nice if the process was documented and available to the MRO members so they understand how the risks are ranked. I still have no idea how the risks are initially identified!
- The voting followed by revoting process and having people with vote scores deviating from the average explain rationale process lead to groupthink and centralized scoring. The intent behind both of the process is good. The intent is for a more educated vote and stimulating discussion. Unfortunately, the process of having people with vote scores deviating from the average incentivizes voters to select a centralized score, so they will not be asked to explain. Voting followed by revoting incentivizes the group to revote like each other.

#### Other



More focus on the reporting of the report with key stakeholders including policy makers.

# RRA Process Improvements Survey Results

**What suggestions do you have to improve either the RRA process, report, or results?**

**Increase involvement with key stakeholders and reporting to policy makers**

- More focus on the reporting of the report with key stakeholders including policy makers.
- Not quite sure how well MRO reached out to the regional entities during the development process of the annual RRA other than working with selected individuals from MRO advisory councils. Hope this approach is consistent with the ERO Enterprise general industry practice.

**Other**

- None. It is currently valuable to our organization.



# 2024 RRA Risk Ranking Workshop

- Two volunteers from each MRO Advisory Council
- Seeking input on two format options
- **Option #1  
Two-day Workshop**
  - Monday 10/23 8am-3pm
  - Tuesday 10/24 8am-3pm
- **Option #2  
Meeting Series**
  - Risk Information Sessions
    - Tuesday 10/17 2-4:30pm
    - Thursday 10/19 2-4:30pm
  - Risk Ranking Workshop
    - Tuesday 10/24 8am-3pm



## AGENDA

### NERC Lessons Learned

*John Grimm, Principal Systems Protection Engineer, MRO*

#### Action

Information

#### Report

John Grimm will provide an update during the meeting.

Classification: **Public**



MIDWEST  
RELIABILITY  
ORGANIZATION

# Recent Lessons Learned (NERC)

**John Grimm**

Principal Systems Protection Engineer

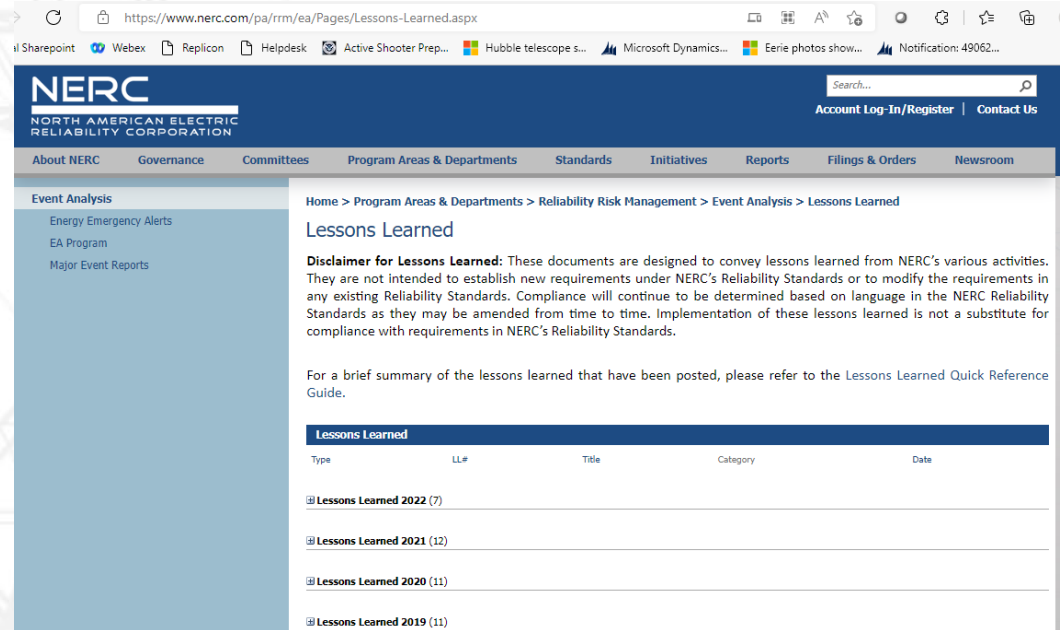
# Where to Find Them

EA Program Page

[Event Analysis \(nerc.com\)](https://www.nerc.com/pa/rmm/ea/Pages/Lessons-Learned.aspx)

Or Directly

[Lessons Learned \(nerc.com\)](https://www.nerc.com/pa/rmm/ea/Pages/Lessons-Learned.aspx)



The screenshot shows the NERC (North American Electric Reliability Corporation) website. The browser address bar displays the URL: <https://www.nerc.com/pa/rmm/ea/Pages/Lessons-Learned.aspx>. The website header includes the NERC logo and navigation links: About NERC, Governance, Committees, Program Areas & Departments, Standards, Initiatives, Reports, Filings & Orders, and Newsroom. A search bar is located in the top right corner. The main content area is titled "Lessons Learned" and includes a disclaimer: "Disclaimer for Lessons Learned: These documents are designed to convey lessons learned from NERC's various activities. They are not intended to establish new requirements under NERC's Reliability Standards or to modify the requirements in any existing Reliability Standards. Compliance will continue to be determined based on language in the NERC Reliability Standards as they may be amended from time to time. Implementation of these lessons learned is not a substitute for compliance with requirements in NERC's Reliability Standards." Below the disclaimer, there is a section for "Lessons Learned" with a table listing lessons learned by year. The table has columns for Type, LL#, Title, Category, and Date. The table shows lessons learned for 2022 (7), 2021 (12), 2020 (11), and 2019 (11).

Home > Program Areas & Departments > Reliability Risk Management > Event Analysis > Lessons Learned

**Lessons Learned**

**Disclaimer for Lessons Learned:** These documents are designed to convey lessons learned from NERC's various activities. They are not intended to establish new requirements under NERC's Reliability Standards or to modify the requirements in any existing Reliability Standards. Compliance will continue to be determined based on language in the NERC Reliability Standards as they may be amended from time to time. Implementation of these lessons learned is not a substitute for compliance with requirements in NERC's Reliability Standards.

For a brief summary of the lessons learned that have been posted, please refer to the [Lessons Learned Quick Reference Guide](#).

Type	LL#	Title	Category	Date
<b>Lessons Learned 2022 (7)</b>				
<b>Lessons Learned 2021 (12)</b>				
<b>Lessons Learned 2020 (11)</b>				
<b>Lessons Learned 2019 (11)</b>				



CLARITY

ASSURANCE

RESULTS

# Recent Activity - Working On



## Lessons Learned Submitted to NERC In-process

SERC – System / Storm Hardening

WECC – Relay Solid State Output Contact Voltage Leakage





# Recent Activity - Recently Posted



## Category of Lessons Learned Published

- **1 NERC Lessons Learned published to date in 2023**
  - 1 - Generation Facilities
  
- **13 NERC Lessons Learned published in 2022**
  - 5 - Bulk Power System Operations
  - 3 - Transmission Facilities
  - 4 - Communications
  - 1 - Relaying and Protection Systems

2

RELIABILITY | RESILIENCE | SECURITY



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ASSURANCE

RESULTS

# Recent Activity - Recently Posted

The image displays four overlapping cards from the North American Electric Reliability Corporation (NERC), each announcing newly posted lessons learned. The cards are tilted and layered, with the most recent card (April 19, 2023) at the bottom right and the oldest (September 28, 2022) at the top left.

**Card 1 (Top Left):** Dated September 28, 2022, titled "Updated Lessons Learned Posted". It mentions a new lesson on "Loss of EMS Functionality due to Server Resource D..." and provides contact information for Sandy Shiflett.

**Card 2 (Top Right):** Dated December 15, 2022, titled "Lessons Learned Posted". It mentions a new lesson on "Air Breaker Cold Weather Operations" and provides contact information for Sandy Shiflett.

**Card 3 (Bottom Left):** Dated November 16, 2022, titled "Lessons Learned Posted". It mentions a new lesson on "Preventing Unwanted Operations during Relay Diagnostic Restarts" and provides contact information for Sandy Shiflett.

**Card 4 (Bottom Right):** Dated April 19, 2023, titled "Lessons Learned Posted". It mentions a new lesson on "Combustion Turbine Anti-Icing Control Strategy" and provides contact information for Sandy Shiflett.

Each card includes the NERC logo, the text "Lessons Learned Posted", the date, a brief description of the new lesson, and contact information for Sandy Shiflett. The cards also feature the text "RELIABILITY | RESILIENCE | SECURITY" and "ASSURANCE | RESULTS".



CLARITY

ASSURANCE

RESULTS

# Recent Activity – Since Last Update

- [LL20230401-Combustion Turbine Anti-Icing Control Strategy](#)
- [LL20221201-Air Breaker Cold Weather Operations](#)
- [LL20221101-Preventing Unwanted Operations during Relay Diagnostic Restarts](#)
- [LL20220901-Loss of Energy Management System Functionality due to Server Resource Deadlock](#)
- [LL20220801-EMS Pausing During Database Deployment](#)
- [LL20220702-Tower Climber Incident](#)
- [LL20220701-Forecasted High Winds](#)



# Closing

- **The goal with publishing lessons learned is to provide industry with technical and understandable information that assists them with maintaining the reliability of the bulk power system.**
- **Entities should have technical/operations staff review all Lessons Learned and comment on the applicability to their systems and/or operations.**



## AGENDA

### NERC Standards Review Forum (NSRF) Update *Gayle Nansel, Reliability Advisory Council Vice Chair*

#### Action

Information

#### Report

Vice Chair Nansel will provide an update during the meeting.

Classification: **Public**

## AGENDA

### Protective Relay Subgroup (PRS) Update *Jake Bernhagen, Manager of Reliability Performance, MRO*

#### Action

Information

#### Report

Jake Bernhagen will provide an update during the meeting.

Classification: **Public**

## AGENDA

### 2023 Meeting Dates

*Dick Pursley, Reliability Advisory Council Chair*

#### Action

Information

#### Report

Chair Pursley will provide an overview during the meeting.

	Q1 2023	Q2 2023	Q3 2023	Q4 2023
RAC	3/1	5/18	8/10	11/9
SAC	2/22	5/24	8/8	10/12
CMEPAC	2/21	5/31	8/9	10/19
PRS	3/14	6/27	9/6	12/5
OGOC	4/12	6/14	9/13	12/13
BOD	4/13	6/15	9/14	12/14

#### MRO CONFERENCE DATES 2023

Q1	RAM Conference: March 21-22, 2023 <b>networking reception and conference (hybrid)</b>
Q2	Reliability Conference: May 16-17, 2023 <b>networking reception and conference (hybrid)</b>
Q3	CMEP Conference: July 25-26, 2023 <b>networking reception and conference (hybrid)</b>
Q4	Security Conference: September 26-27, 2023 <b>networking reception, training and conference (hybrid); Oklahoma City, OK</b>

Classification: **Public**

## AGENDA

### RAC Member Roundtable

*Dick Pursley, Reliability Advisory Council Chair*

#### Action

Discussion

#### Report

Chair Pursley will lead this discussion during the meeting.

Classification: **Public**



## AGENDA

### Other Business and Adjourn

*Dick Pursley, Reliability Advisory Council Chair*

#### Action

Discussion

#### Report

Chair Pursley will lead this discussion during the meeting.

Classification: **Public**