



Minutes of the Reliability Advisory Council Meeting

St. Paul, MN and Webex

Wednesday, November 16, 2022, 9:01 a.m. to 2:29 p.m. Central

*Notice for this meeting was electronically posted to the MRO [website](#) on October 19, 2022.
A final agenda, including advanced reading materials, was also posted on November 9, 2022.*

1. Call to Order and Determination of Quorum

The Reliability Advisory Council (RAC) Chair, Dick Pursley called the meeting to order at 9:01 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 highlighted a new agenda item 10 Planning Coordinator Updates from Southwest Power Pool (SPP) and Midcontinent Independent System Operator (MISO). The next quarter updates will be from Manitoba Hydro (MH) and Saskatchewan Power Corporation (SPC). He also highlighted agenda item 11a Long-Term Reliability Assessment (LTRA), 11b Regional Winter Assessment (RWA), and 11c Regional Risk Assessment (RRA).

Pursley reviewed upcoming events and meeting schedules.

Pursley advised that 2023 leadership on the RAC would be decided in January 2023 and voted on electronically. He stated that the Vice Chair position may become open and encouraged members to consider leadership. Pursley pointed members to the ERO Enterprise Facility Ratings Best Practice Report on the NERC website. He also shared that Mark Gutzmann, Xcel Energy, would be receiving the Compass Award for eleven years of service as the MRO Representative on the NERC System Protection and Control Working Group (SPCWG) and recognized him for his contributions to the working group.

4. Consent Agenda

The RAC reviewed the consent agenda, which included draft minutes from the August 17, 2022 meeting. Also included were the nominee recommendations for the RAC, Protective Relay Subgroup (PRS) and MRO Representatives on the NERC Inverter-Based Resource Performance Subcommittee (IRPS) and the NERC System Protection and Control Working Group (SPCWG) which will be reviewed by the OGOC for approval. A typo was noted and corrected in the August 17, 2022 minutes.

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



5. MRO Board of Directors, OGOC and General Update

Clark provided a recap of the third quarter OGOC meeting on Sept. 21, 2022, at which the OGOC held a risk roundtable discussion regarding Variable Transmission Line Ratings. Ron Gunderson attended the risk roundtable on behalf of the RAC. The RAC must identify a representative to attend the next OGOC Risk Roundtable at the first quarter meeting on April 12, 2023. The topic has not yet been determined.

6. 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 Sept. 13-14, 2022, which was held at the MRO offices. Topics included Inverter Based Resources (IBR) and Distributed Energy Resources (DER) as well as Generating Availability Data System (GADS). The RSTC approved the 2022 Winter Assessment and reviewed the 2022 Long-Term Reliability Assessment (LTRA). Sector elections for the RSTC are in progress. The next meeting is scheduled for December 6-7, 2022.

7. MRO Representatives on NERC Subgroups

NERC Electric Gas Working Group (EGWG) – Jaimin Patel

The NERC EGWG has not met since the last RAC meeting. The EGWG sent out an Effectiveness Survey in regards to the Bulk Power System Reliability Guideline: Fuel Assurance and Fuel-Related Reliability Risk Analysis on September 27, 2022.

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

Brauch provided an overview of the recent IRPS activities, which included an EOP-004 Standard Authorization Request (SAR) and IRPS guideline revisions to incorporate IEEE 2800. Several accomplishments were noted in Brauch's report, including several technical presentations on Grid Forming control schemes and their uses via Webex on October 20, 2022. Brauch reported that the amount of Grid-Forming inverters to maintain stability does not depend on IBR penetration but the number of synchronous machines online. A RAC member asked who is studying the number of synchronous machines needed online to maintain stability. Brauch mentioned that NERC is taking the lead on this study. There was also a discussion about EMT Modeling and specialized studies. There was further discussion around how to mandate the installation of Grid Forming inverters and changes to pro forma interconnection agreements. Discussion ensued.

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

Guttormson provided a recap of the meeting on Oct. 31 and Nov. 1, 2022. Several work plan deliverables will be submitted for RSTC action at the December 2022 meeting, including two Standard Authorization Requests (SAR), a Reliability Guideline, and a white paper.

NERC System Protection and Control Working Group (SPCWG) – Mark Gutzmann

Gutzmann provided a written report noting several key areas of focus including FERC Order 881a, Footnote 13 to Table 1 of TPL-001-5.1, and testing requirements under PRC-005-6 due to IEC-61850. The SPCWG published an Inter-Entity Short Circuit Model white paper. No challenges were noted.

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

A written report was not provided for the NERC ERATF because the task force had not met since the last RAC meeting. The next meeting is scheduled for November 30, 2022.



8. 2022 Work Plan Update

Action Item Review.

Chair Pursley reviewed the action items in the 2022 work plan. Updates were made accordingly. Discussion ensued.

2023 Work Plan

The RAC members drafted a 2023 work plan largely based on many of the key objectives from the 2022 work plan. MRO staff will clean up the draft 2023 work plan following this meeting in preparation for requesting approval from the OGOC at their meeting scheduled for November 30, 2022.

A Reliability Conference Planning Committee was formed to start planning for the 2023 conference which will take place on May 16-17 in St. Paul, MN. The committee members are Dick Pursley, Dallas Rowley, Bryn Wilson, Jeremy Severson and Bryan Clark.

Reliability Risk Matrix Updates

Clark reported that the Reliability Risk Matrix is being considered by a small subteam under the NERC RISC. In the meantime, the MRO has been using the matrix over the past two years for their annual regional risk assessments. The RAC agreed to remove the Reliability Risk Matrix from the 2023 Work Plan.

Cold Weather Preparedness Workshop Debrief

RAC member, Bryn Wilson, provided a debrief of the Cold Weather Preparedness Workshop which took place on October 12, 2022. Wilson commented on the informative presentations and the strong attendance with 303 virtual participants. RAC member, C.J. Brown, acted as the emcee for the webinar. The presenters were Jacob Zettel, Montana-Dakota Utilities (MDU), Tom Whynot, Manitoba Hydro (MH) and Matthew Harward, Southwest Power Pool (SPP). The workshop feedback from the survey was largely positive. Wilson volunteered to draft a newsletter article about the workshop that will include a link to a recording of the workshop.

9. Reliability Coordinator Updates

Midcontinent Independent System Operator (MISO)

Andy Witmeier, RAC member, provided an oral report. Witmeier noted fall weather has been moderate and MISO operations were as expected. MISO continues to see peak and average loads returning to pre-COVID levels. Energy prices are reflecting high natural gas prices as compared to last year. There are sufficient resources to cover the winter peak load forecast. MISO is projecting a peak load of 102 GW in January 2023 with available generator capacity of 113 GW.

Winter 2022-2023 forecast is for slightly warmer than normal temperatures in the south and slightly colder than normal in the central and north regions. January shows an increased likelihood in reliance on Load Modifying Resources (LMRs) and operating reserves if there is a significant cold front. Witmeier reported that FERC has approved their season adequacy construct. Therefore, MISO is moving to a seasonal construct next year and members will need to procure generation for all four operating seasons vs. procuring generation based only on summer peak conditions.

Saskatchewan Power Corporation (SPC)

Binod Shrestha, RAC member, provided an oral report on expected operations during the 2022-2023



winter season. Shrestha noted that SPC is expecting winter (November – April) loads between 3,300 MW and 3,700 MW. Most of the generation fleet is powered by coal, gas and hydro. Fuel supply is expected to be adequate for the winter season. Wind installed capacity is approximately 650 MW with only ten percent assumed for capacity purposes. SPC has no significant planned transmission outages this winter and expects to have a 28 percent reserve margin. Shrestha noted no capacity concerns for the upcoming winter or any supply or transportation issues for coal or natural gas.

Southwest Power Pool (SPP)

C.J. Brown, RAC member, provided an oral report on winter readiness for the upcoming season. Brown presented highlights from SPP's winter workshop. Loads are forecasted to be between 42 – 45 GW with no resource challenges expected. He noted continued struggles to approve planned maintenance at generating stations due to resource alerts during cold weather events. Brown concluded by indicating that the winter outlook looks good unless another extreme winter storm occurs. A member asked if requested outages on transmission facilities for routine maintenance are also being denied by SPP. Brown commented that it had more to do with the Generation Assessment Process (GAP) than transmission. A member commented about increased generation capacity and stress on the transmission system.

10. Planning Coordinator Updates

Southwest Power Pool (SPP)

Jason Davis, SPP, provided an oral report on planning activities underway within SPP. Davis reported on the regional findings from their latest Integrated Transmission Plan which identified three low-voltage events, eighteen thermal events and nine breaker replacements. To address the issues identified, SPP is recommending four rebuilds (1 in Iowa, 3 in Oklahoma). Terminal equipment replacements were also identified at various regional borders. Davis noted a capacitor addition needed in New Mexico to address low-voltage issues. SPP's Board approved their latest Integrated Transmission Plan in October 2022.

SPP recently completed a study evaluating a transmission service request for transmission service into Saskatchewan. The analysis was completed and identified a need for two additional 230 kV lines with terminal upgrades. SPP will coordinate with the Canadians regarding the identified connections. Davis indicated that Saskatchewan Power Corporation is currently working on their study for this transmission service request. Davis noted a Presidential permit will be needed to increase SPP's export capability into Canada. A member asked how many 230 kV lines were being added.

To accommodate scheduling conflicts, Chair Pursley moved one Planning Coordinator Update (Agenda Item 10a) further back on the agenda. These minutes reflect the order in which the reports were provided.

Midcontinent Independent System Operator (MISO)

RAC member, Andy Witmeier, provided an update on MISO's Long-Range Transmission Plan (LRTP) and other Planning Coordinator Activities. Tranche 1 of MISO's LRTP was approved in July by the MISO Board and represents the first iteration of regional transmission development that includes 18 projects across the MISO Midwest region estimated at \$10.3B. The identification of the Tranche 2 Portfolio is starting now – MISO is updating the Futures' assumptions and building models to begin reliability analysis. The Tranche 3 Portfolio will be focused on MISO's southern footprint and is targeted



at being approved in December 2024. There was a question about the projects' support of NW Ohio and SE Michigan.

Witmeier next provided an overview of the MISO-SPP Joint Targeted Interconnection Queue (JTIQ) Study. The SPP-MISO JTIQ Study focuses on optimizing transmission needed for generator interconnection across the seams for the evolving resource mix. Witmeier noted a FERC filing is planned for the first quarter of 2023 that will update how affected system studies are done between SPP and MISO as well as propose a cost allocation for JTIQ projects. Witmeier also provided a summary of the new interconnection requests submitted as part of the 2022 Definitive Planning Phase which includes 956 requests totaling 171 GW of new generation across MISO. A RAC member asked what assumptions are used to determine when the LRTP projects would be in service to accommodate new resources in the upcoming interconnection studies. A RAC member also asked how MISO manages the queue for new interconnection requests. Discussion ensued.

11. Assessment Review

Review Long-Term Reliability Assessment (LTRA)

MRO Principal Reliability Assessment Engineer, Salva Andiappan, presented the 2022 Long-Term Reliability Assessment (LTRA) Report. The 5-year projected reserve margins for each of the MRO Planning Coordinators (PC) was reviewed. Andiappan also presented the Solar and Wind nameplate capacity for each PC, illustrating existing and planned additions through 2032. Transmission development trends were also reviewed. A tentative date of January 19, 2023 was selected for the 2022 LTRA webinar. Discussion ensued.

Upon a motion duly made and seconded, the RAC accepted the 2022 LTRA Report prepared by each of the MRO Planning Coordinators – Manitoba Hydro (MH), Midcontinent Independent System Operator (MISO), Saskatchewan Power Corporation (SPC) and Southwest Power Pool (SPP).

MRO Regional Winter Assessment (RWA)

Next, Andiappan provided an overview of the MRO 2022/2023 Regional Winter Assessment (RWA). Andiappan highlighted these key findings: possible energy shortfalls could occur across the MISO region during extreme winter peak load conditions with unplanned generation outages. SPP, MH and SPC anticipate sufficient resources to meet reserve margin requirements under normal and extreme demand for the 2022/2023 winter season. Coal delivery issues could be an emerging reliability concern for MISO and SPP. Long-term trends indicate increasing generation forced outage rates.

There was discussion about the 46 misoperations between December 1, 2021 and February 28, 2022 with nearly half being attributed to human errors. The group discussed possible causes including loss of institutional knowledge due to an aging workforce (retirements), more complex relay systems, and the use of contractors. A member suggested reaching out to ReliabilityFirst to see if they have a Lessons Learned that could be shared with the Protective Relay Subgroup (PRS).

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 is a foundational document that drives MRO's annual work plan, the organizational groups' work plans, and MRO's strategic plan. It began with risk identification which concluded in September and then the risks were ranked. Volunteers from each



advisory council helped rank the risks using the Reliability Risk Matrix. Gayle Nansel and Jason Weiers were the RAC members who volunteered to help rank the risks during a two-day session in October. The report will be published in January 2023. A member asked how the RRA is communicated to stakeholders. Tiemeier commented that communications to external stakeholders is being discussed by MRO staff to identify ways to improve outreach and awareness. Clark advised that MRO staff is willing to give a presentation to entities at their location upon request.

12. NERC Standards Review Forum Update

RAC member, Gayle Nansel, provided an update of the NERC Standards Review Forum (NSRF). Nansel will continue to attend the NSRF meetings, review the weekly meeting minutes and forward items to the RAC for discussion at future RAC meetings.

13. 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 fourth quarter meeting that is scheduled on December 6, 2022, including a pilot to review the quarterly misoperations during the meeting. He commented that a challenge is expressing the total number of misoperations as a percent of the total number of operations being misleading because of the declining number of total operations. As a result of the total operations declining, the number of misoperations in the MRO region did not look favorable during the second quarter and the trend was expected to continue in the third quarter. Bernhagen noted that MRO staff is exploring alternative ways to share this information to show that the number of misoperations is going down with time. A member asked about planned outreach efforts in 2023, and a suggestion was made to hold a lessons learned webinar regarding best practices for commissioning.

14. 2023 Meeting Dates

Chair Pursley reviewed the 2023 meeting dates for the RAC, as well as the other councils and subgroups. It was noted that the RAC fourth quarter meeting on November 8, 2023 may conflict with the 2023 Minnesota Power Systems Conference (MIPSYCON).

15. RAC Member Roundtable

Chair Pursley invited member participants to share other relevant industry observations. Topics discussed included, potential Electromagnetic Pulse (EMP) weapon or attacks, new RAC leadership in 2023, and Great River Energy's plans to move its control center to Maple Grove, Minnesota.

16. Other Business and Adjourn

Having no further business to discuss, the meeting was adjourned at 2:29 p.m.

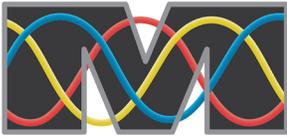
Prepared by: Rebecca Schneider, Reliability Analysis Administrator.

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



Exhibit A – Meeting Attendees

| Reliability Advisory Council Members Present | |
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| Name | Organization |
| Dick Pursley, Chair | Great River Energy |
| Jason Weiers, Vice Chair | Otter Tail Power Company |
| Andy Witmeier | MISO |
| Binod Shrestha | Saskatchewan Power Corporation |
| C.J. Brown | Southwest Power Pool, Inc. |
| Dallas Rowley | Oklahoma Gas & Electric |
| Derek Brown | Evergy |
| Dwayne Stradford | American Electric Power |
| Gayle Nansel | Western Area Power Administration |
| Jeremy Severson | Basin Electric Power Cooperative |
| John Stephens | City Utilities of Springfield Missouri |
| Nandaka Jayasekara | Manitoba Hydro |
| Ron Gunderson | Nebraska Public Power District |
| W. Bryn Wilson | Oklahoma Gas & Electric |
| MRO Staff Present | |
| Name | Title |
| Bryan Clark | Director of Reliability Analysis |
| Rebecca Schneider | Reliability Analysis Administrator |
| Margaret Eastman | Security Administrator |
| Lisa Stellmaker | Executive Administrator |
| Mark Tiemeier | Principal Technical Advisor |
| Salva Andiappan | Principal Reliability Assessment Engineer |
| Jake Bernhagen | Senior Systems Protection Engineer |



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| John Grimm | Principal Systems Protection Engineer |
| Steen Fjalstad | Director of Security |
| Kristine Albrecht | Human Resource Generalist |
| Cris Zimmerman | Manager of Outreach and Stakeholder Engagement |
| Other Attendees | |
| Name | Organization |
| David Brauch | MISO |
| Wayne Guttormson | Saskatchewan Power Corporation |
| Jaimin Patel | Saskatchewan Power Corporation |
| Jason Davis | Southwest Power Pool |
| Derek Cherneski | Saskatchewan Power Corporation |
| Larry Brusseau | Corn Belt Power Cooperative |
| Josh Ross | Southwest Power Pool |