



Minutes of the Protective Relay Subgroup Meeting

Hybrid: St. Paul, MN and Webex

Tuesday, March 14, 2023, 9:00 a.m. to 3:24 p.m. Central

Notice for this meeting was electronically posted to the [MRO website](#) on February 14, 2023.

A final agenda, including advanced reading materials, was also posted on March 7, 2023.

1. Call to Order and Determination of Quorum

Protective Relay Subgroup (PRS) Chair Ryan Einer called the meeting to order at 9:00 a.m. Einer welcomed everyone and roundtable introductions were made. Rebecca Schneider, Reliability Analysis Administrator, advised the chair that a quorum of the PRS 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, MRO Manager of Reliability Performance, Jake Bernhagen highlighted MRO's Standards of Conduct, Conflict of Interest, and Antitrust Guidelines.

3. Safety Briefing

Bernhagen gave a safety briefing for in-person attendees which included information regarding emergency exits, evacuation procedures, and the location of the automated external defibrillator (AED).

4. Chair's Remarks

Chair Einer introduced himself and Dennis Lu as this year's PRS chair/vice chair and thanked the previous chair/vice chair for their service and expressed appreciation for their leadership.

5. New Members' Welcome Presentation

Bernhagen provided an overview of the welcome presentation for new members. Bernhagen discussed his new role at MRO and expressed appreciation to the PRS members. Bernhagen also reviewed key PRS responsibilities, the meeting structure including closed sessions, MRO's reimbursement policy for travel costs, and future meeting dates. Bernhagen discussed webinars and potential PRS member participation.

6. Consent Agenda

The PRS reviewed the consent agenda, which included minutes from the December 6, 2022 meeting.

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

7. NERC Activities

Update on NERC System Protection and Control Working Group (SPCWG).

Lynn Schroeder, MRO representative on the NERC SPCWG, provided an update. Schroeder noted the position paper related to FERC Order 881 is in final draft and scheduled for approval in April. 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 group is looking for members to help research and write the document. The SPCWG is also reviewing and updating two white papers. The PRC-019 Implementation Guidance has been posted for industry. The next meeting is April 12-13, 2023 in Charlotte, NC.

NERC Misoperation Information Data Analysis System User Group (MIDASUG) Update.

Bernhagen provided an update from the MIDASUG meeting on February 7, 2023. There was discussion around misoperation impact metric that NERC has been developing with the regions to supplement the misoperation ratio metric. The group also discussed removing the “seconds” field from misoperations reporting times. Bernhagen noted a discussion around potential Section 1600 changes (added fields) related to quantifying misoperations impact. The last item mentioned was MIDAS (virtual) training that would take place in the fall.

Transmission Availability Data System (TADS).

Bernhagen noted challenges with TADS reporting in 2022, and that MRO Principal Systems Protection Engineer, John Grimm, has been working through the reporting issues with the entities.

8. PRS Business

Updates.

Bernhagen noted that a new PRS liaison should be in place by the next meeting in June 2023.

Charter Review

Schneider provided a brief overview of the charter review process. PRS members reviewed the charter. Bernhagen solicited questions and/or feedback from the members. Receiving none, the charter will be submitted to the Reliability Advisory Council (RAC) for approval.

Action Item List Review.

Chair Einer reviewed the action item list and updates were made accordingly. Bernhagen noted volunteer needs and requested members contact him if interested. An action item was added to review the NERC SPCWG white papers with a target date of Q2 2023.

9. 2023 Meeting Dates

Chair Einer reviewed the proposed 2023 meeting dates for the PRS and the other councils and subgroups.

10. Misoperations Measures

Jack Norris, Electrical Engineer, NERC, provided an oral report during the meeting.

Norris explained that the misoperations rate metric was intended to be a simple calculation that provides an aggregate performance measure for NERC and the regions to measure the performance of the grid. Norris shared concerns with the drawbacks of the misoperation rate metric and the purpose of a new metric that takes into account the impact of a misoperation on the bulk electric system. He discussed additional methods of evaluation to refine calculations to better reflect nuances. NERC performed a regional comparison of the current measures. NERC decided to focus on four factors: voltage class, equipment type, cause, and category. Norris explained the factors involved in



impact calculation. NERC used some factors from each regional score – continue to alter based on feedback. Norris shared observations and considerations for the MIDAS User Group.

Bernhagen asked when score will be first used, Norris explained they are hoping to use in State of Reliability Report. Discussion ensued.

11. FERC Order 881 Update and Discussion

Rich Bauer, Associate Principal Engineer, NERC, provided an oral report during the meeting.

Bauer lead a discussion on how FERC Order 881 relates to PRC-023. Bauer recapped the history of the 2003 blackout and how PRC-023 came out of Technical Initiative 8 of Appendix D of the U.S.- Canada PSOTF Final Report on the August 14th, 2003 Blackout. Bauer reviewed the main relay requirements in the PRC-023 Standard. Bauer discussed the impact FERC Order 881 has on entities who do not have seasonal ratings. FERC Order 881 requires Ambient-Adjusted transmission line ratings (AARs) determined at least hourly. These ratings are used for near-term transmission service (10 days to real time). Seasonal line ratings must be calculated using at least four seasons, calculated annually. Emergency ratings must also include AAR calculations.

The purpose of the PRC-023 Standard was to allow for temporary overloads. What is the impact of FERC Order 881A on PRC-023? What is the highest seasonal facility rating? FERC intimated that to be compliant with PRC-023, the settings have to meet the highest anticipated hourly ambient adjusted rating (AAR). The SPCWG is working on a position paper to address this question. A sample of the methodology showed that some entities may see a 20 percent increase in loadability in their transmission line ratings. Discussion ensued.

12. MRO Regional Risk Assessment (RRA)

MRO Principal Technical Advisor, Mark Tiemeier, provided an overview of the 2023 Regional Risk Assessment (RRA).

Tiemeier reviewed the process in developing the Regional Risk Assessment (RRA) and explained the purpose of the report. Tiemeier noted that 17 identified risks were identified in this year's report. Some of the overarching themes included rapid changes in technology, changing resource mix, evolving consumer demand, challenges in forecasting, and the impact of extreme weather. Tiemeier focused on the risks pertaining to protection systems for this meeting. There was discussion around the tightening labor supply and challenges related to hiring and retaining protection engineers. Discussion ensued.

13. Commissioning Lessons Learned – Grand River Dam Authority

Manager, Protection and Control Engineering, Grand River Dam Authority (GRDA) and PRS member, Jeff Beasley, provided an oral report during the meeting. Beasley discussed two specific relay events from January 2023. Beasley shared the changes that were made as a result of the lessons learned and noted the need to improve quality assurance (QA). Beasley invited questions and discussion. Discussion ensued.



14. Misoperations

2022 Update, Review and Discussion

Bernhagen provided an overview of the 2022 misoperations data. There was a marked increase in the number of overall operations compared to the previous year. MRO had 281 misoperations in 2022 with an 8.7 percent misoperation rate, higher than the ERO average. Incorrect settings was the highest cause, followed by relay failures/malfunctions. Bernhagen was concerned with the 125 misoperations categorized as unknown/unexplainable.

2023 ERO Misoperation Workshop Discussion

Bernhagen discussed a potential misoperation workshop in 2023. NERC is kicking off an initiative to host a two-day misoperation workshop. Potential areas of focus for the workshop will likely be misoperations related to human error and incorrect settings. NERC is targeting September as the timeframe for the workshop, and the location has not been determined. Bernhagen noted that PRS members may be contacted as potential presenters. Discussion ensued.

Review NERC Lessons Learned

Bernhagen encouraged entities who have air blast breakers in their system to read the lessons learned published on December 15, 2022.

15. Q4 2022 Misoperations Review

Breakout Sessions

The PRS members reviewed the fourth quarter 2022 misoperations in breakout sessions both in-person and via Webex. Discussion ensued.

16. PRS Roundtable Discussion

Chair Einer invited member participants to share other relevant industry observations. Topics discussed included, breaker failure timer settings.

17. Other Business and Adjourn

Having no further business to discuss, the meeting was adjourned at 3:24 p.m.

Prepared by: Rebecca Schneider, Reliability Analysis Administrator

Reviewed and Submitted by: Jake Bernhagen, Manager of Reliability Performance



Exhibit A – Meeting Attendees

Subgroup Members Present	
Name	Company
Ryan Einer, Chair	Oklahoma Gas & Electric
Dennis Lu, Vice Chair	Manitoba Hydro
Adam Daters	ITC Holdings
Alex Bosgoed	Saskatchewan Power Corporation
Casey Malskeit	Omaha Public Power District
Cody Remboldt	Montana-Dakota Utilities
David Weir	Western Area Power Administration
Derrick Schlangen	Great River Energy
Greg Hill	Nebraska Public Power District
Greg Sessler	American Transmission Company
Jeff Beasley	Grand River Dam Authority
Josh Erdman	Xcel Energy
Lynn Schroeder	Sunflower Electric Power Corporation
Rochelle Trefry	MidAmerican Energy Company
Sarah Marshall	Alliant Energy
MRO Staff Present	
Name	Title
Jake Bernhagen	Manager of Reliability Performance
Rebecca Schneider	Reliability Analysis Administrator
Margaret Eastman	Security Administrator
John Grimm	Principal Systems Protection Engineer
Mark Tiemeier	Principal Technical Advisor



Other Attendees	
Name	Company
Jack Norris	NERC
Rich Bauer	NERC
Dylan Underwood	Southwestern Power Administration
Allan Bekkala	Minnesota Power
Gayan Wijeweera	Manitoba Hydro
Toby Johnson	Otter Tail Power Company
Terry Volkmann	Glencoe Light and Power
Elsammani Ahmed	ITC Midwest
Tyler Mitchell	Otter Tail Power Company
Craig Talbot	Minnesota Power
Tyler Baxter	Corn Belt Power Cooperative
Matt Wyatt	Liberty Utilities
Moeed Shamim	Saskatchewan Power Corporation
Kasey Borboa	Minnkota Power Cooperative
David Oswald	Liberty Utilities
Mark Gutzmann	Xcel Energy
Lauren Donati	Xcel Energy
Gabe Kainz	Otter Tail Power Company