



Minutes of the Protective Relay Subgroup Meeting

Hybrid: St. Paul, MN and Webex

Wednesday, September 6, 2023, 9:01 a.m. to 3:12 p.m. Central

*Notice for this meeting was electronically posted to the [MRO website](#) on August 9, 2023.
A final agenda, including advanced reading materials, was also posted on August 30, 2023.*

1. Call to Order and Determination of Quorum

Protective Relay Subgroup (PRS) Vice Chair Dennis Lu called the meeting to order at 9:01 a.m. Lu welcomed everyone, and roundtable introductions were made. Rebecca Schneider, Reliability Analysis Administrator, advised the vice 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

MRO Outreach Coordinator, Shawn Keller, 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. Vice Chair's Remarks

Vice Chair Lu shared that he would be leading today's meeting as the PRS Chair, Ryan Einer, was unavailable to attend. Lu highlighted the upcoming nomination period at MRO and noted that there are six seats on the PRS with terms expiring at the end of 2023. Lu encouraged anyone interested in serving on the PRS to apply, and he reminded the current members to self-nominate if they are interested in continuing to serve on the PRS.

5. Consent Agenda

The PRS reviewed the consent agenda, which included minutes from the June 27, 2023, meeting.

[Upon a motion duly made and seconded, the PRS approved the consent agenda in its entirety.](#)

6. NERC Activities

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

Lynn Schroeder, MRO representative on the NERC SPCWG, provided an update. She noted that the SPCWG's position on FERC Order 881 (Ambient Adjusted Ratings) related to PRC-023 has not changed. SPCWG recommends the entities review loadability for all protection systems that fall under the order to ensure sufficient margin above normal and emergency AARs. Schroeder also noted a draft PRC-024 IBR White Paper that is complete and currently under review as well as a Standard Authorization Request (SAR) on PRC-006 submitted by the NERC System Planning Impacts from DER Working Group (SPIDERWG). She mentioned the Technical Reference related to maintenance for Ethernet-based P&C. The next meeting is October 24, 2023, in Atlanta. Discussion ensued.



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

Bernhagen provided an update from the August 1, 2023, meeting. The group is considering a Section 1600 reporting change related to the “equipment removed from service” field. This field is currently free form, and the responses have not been particularly useful in terms of event analysis. NERC may replace this field with a distinct count and names of units. A draft proposal is forthcoming. The third quarter meeting will take place in October in Atlanta. Bernhagen noted that annual MIDAS training will be held in November (TBD). Discussion ensued.

Transmission Availability Data System (TADS).

John Grimm, MRO Principal Systems Protection Engineer, provided an update on TADS. Grimm noted that TADS in-person training will take place on October 18-19, 2023, in Atlanta. Additionally, there are training videos located on the NERC website. Grimm mentioned that NERC is missing critical information related to large-scale outages and load loss data, and NERC is looking for volunteers to participate in a task force to assist with this project.

7. PRS Business

Updates.

Bernhagen shared a draft NERC Lessons Learned entitled, “Protective Relay Solid State Output Contact Voltage Leakage.” He solicited the PRS members to see if any of the entities has a photo or could take a photo of the resistor installation described in the Lessons Learned. NERC is seeking this photo before publication of the Lessons Learned.

Bernhagen also noted that NERC is still looking for panelists to participate in the Misoperations Workshop in Atlanta on the following topics: Incorrect Settings and Using Contractors for Commission Testing.

Action Item List Review.

Vice Chair Lu reviewed the action item list and updates were made accordingly. An action item was added for a possible joint meeting with another region’s relay subgroup within the ERO Enterprise in 2024.

8. 2023 Meeting Dates

Vice Chair Lu reviewed the proposed 2023 meeting dates for the PRS and the other councils and subgroups. Bernhagen proposed Monday, October 23 for the PRS Membership Selection meeting which will take place via Webex. It was noted that a quorum is needed for the voting to take place.

To accommodate schedules, Vice Chair Lu moved the Technical Presentations (Agenda Item 10a and 10b) ahead on the agenda. These minutes reflect the order in which the reports were provided.

9. Technical Presentation

PRC Impacts on Ethernet Based Protection & Control Device Maintenance and Design

Eric Udren, Executive Director, Quanta Technology, LLC gave a presentation on IEC 61850 Substation P&C Architecture and NERC Standards for Definition of Protection System. Udren highlighted the project team and the NERC standards that are impacted or have clarity issues. The purpose of this work is to advise NERC and the industry in 2023 on the impact of emerging P&C technologies on



standards, definitions, and compliance with a focus on Ethernet IEC 61850 substations. Udren outlined the three main goals of the SPCWG Technical Reference team: explain technical issues, give interpretation advice, and recommend standard changes. He noted the draft Technical Reference document is in progress for release in early 2024. Discussion ensued.

WAPA's Geomagnetic Disturbance (GMD) Project Presentation

Chris Colson, Transmission System Planning Manager, Western Area Power Administration, gave a presentation on WAPA's actions for preparation and defense against space weather effects on the transmission system. Colson operates in the Upper Great Plains Region, which is the largest of WAPA's four regions. He discussed why space weather matters in the electronic age, and the occurrence of geomagnetic disturbances (GMD) caused by space weather. Colson also illustrated how geomagnetically-induced current (GIC) can cause significant electric transmission system disruption. Colson concluded that both GIC monitoring and neutral blocking devices (NBD) offer opportunities for improved EOP-010-1 awareness and defensive operations. Discussion ensued.

10. Commissioning Lessons Learned – Montana-Dakota Utilities

Cody Remboldt, System Protection Engineer, MDU and PRS member, gave a presentation on MDU's 5-step management process for relay settings. Remboldt shared that MDU revamped the process in 2021 and moved to a Relay Setting Database instead of managing relay settings in Windows Explorer. He noted that using version fields in the philosophy documentation has been successful in the review process. Remboldt summarized that the adoption of setting versions, instead of dates, and the use of the Relay Setting Database for tracking setting progress has lessened confusion and strengthened confidence that the settings are accurate. Discussion ensued.

11. Misoperations

Q2 2023 Update, Review and Discussion

Bernhagen provided a summary of MRO's second quarter 2023 misoperations data. The overall misoperation rate of 8.5 percent is comparable to previous years. In the second quarter, there were eighty-five misoperations and 950 total operations. Bernhagen reported a high number of misoperations "not during a fault." The leading cause of misoperations was "Relay Failures" followed by "Other/Explainable" and "Incorrect Settings." He also noted that one fifth of the misoperations reported left the scheme field blank. Bernhagen provided instructions for the misoperations review taking place in breakout sessions later in the meeting. Discussion ensued.

Review NERC Lessons Learned

Bernhagen directed the PRS members to visit the NERC website to find the latest Lessons Learned. He noted that at least one new Lessons Learned has been published since the last PRS meeting.

2023 ERO Misoperation Workshop Update

Bernhagen polled the group to see if anyone was planning to attend the NERC ERO Misoperation Workshop on October 25-26, 2023, in Atlanta, GA. He also reminded members that NERC is looking for panelists.



12. PRS Roundtable Discussion

Vice Chair Lu invited member participants to share other relevant industry observations. Topics discussed included applying split phase type protection to a multi-leg oil filled reactor.

13. Q2 2023 Misoperations Review

Breakout Sessions

The PRS members reviewed the second quarter 2023 misoperations in breakout sessions both in-person and via Webex. Discussion ensued.

14. Other Business and Adjourn

Having no further business to discuss, the meeting was adjourned at 3:12 p.m.

Prepared by: Rebecca Schneider, Reliability Analysis Administrator

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



Exhibit A – Meeting Attendees

PRS Members Present	
Name	Company
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
David Wheeler	Southwestern Public Services Co.
Glenn Bryson	American Electric Power
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
Scott Paramore	Kansas City Board of Public Utilities
Terry Fett	Central Iowa Power Cooperative
MRO Staff Present	
Name	Title
Jake Bernhagen	Manager of Reliability Performance
Rebecca Schneider	Reliability Analysis Administrator
Shawn Keller	Outreach Coordinator
John Grimm	Principal Systems Protection Engineer



Eric Graftaas	Principal Power Systems Engineer
Max Desruisseaux	Senior Power Systems Engineer
Joshua Hebert	Senior Compliance Engineer, O&P
Other Attendees	
Name	Company
David Oswald	Liberty Utilities
Chris Colson	Western Area Power Administration
Ed Ruck	NERC
Eric Udren	Quanta Technology, LLC
Dylan Underwood	Southwestern Power Administration
Gayan Wijeweera	Manitoba Hydro
Kevin Ostash	Manitoba Hydro
Mark Gutzmann	Xcel Energy
Matthew Wyatt	Liberty Utilities
Terry Volkmann	Glencoe Light and Power
Tyler Baxter	Corn Belt Power Cooperative
Tyler Porter	Great River Energy