

# Meeting Agenda

## Protective Relay Subgroup (PRS)

**Tuesday, March 12, 2024**  
**9:00 a.m. to 3:00 p.m. Central**

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



**MIDWEST  
RELIABILITY  
ORGANIZATION**

380 St. Peter St, Suite 800  
Saint Paul, MN 55102

651-855-1760

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

**Public**

## 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.

## 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. Regularly attend meetings of the group(s) on which the member serves.
2. Competently prepare for, and be an active participant in, the meetings for the group(s) on which the member serves.
3. Collaborate with other organizational group members in support of the mission, vision, and strategic initiatives of MRO.
4. Support the Highly Effective Reliability Organization (HERO™) principles.

## MRO PROTECTIVE RELAY SUBGROUP MEETING AGENDA

| Agenda Item        |   |
|--------------------|---|
| 1                  | <b>Call to Order and Determination of Quorum</b><br><i>Dennis Lu, PRS Chair</i><br>a. Determination of Quorum and Introductions<br>b. Robert's Rules of Order   |
| 2                  | <b>Standards of Conduct and Antitrust Guidelines</b><br><i>John Grimm, Principal Systems Protection Engineer, MRO</i>   |
| 3                  | <b>Safety Briefing</b><br><i>Shawn Keller, Outreach Coordinator, MRO</i>  |
| 4                  | <b>Chair's Remarks</b><br><i>Dennis Lu, PRS Chair</i>   |
| 5                  | <b>New Members' Welcome Presentation</b><br><i>Rebecca Schneider, Reliability Analysis Administrator, MRO</i>   |
| 6                  | <b>Consent Agenda</b><br><i>Dennis Lu, PRS Chair</i><br>Approve December 6, 2023, meeting minutes   |
| 7                  | <b>NERC Activities</b><br><i>John Grimm, Principal Systems Protection Engineer, MRO</i><br>a. NERC SPCWG Update<br><i>Lynn Schroeder, System Protection Engineer, Sunflower Electric Power Corporation</i><br>b. NERC MIDASUG Update<br><i>John Grimm, Principal Systems Protection Engineer, MRO</i><br>c. TADS<br><i>John Grimm, Principal Systems Protection Engineer, MRO</i> |
| 8                  | <b>PRS Business</b><br><i>John Grimm, Principal Systems Protection Engineer, MRO</i><br>a. Updates<br>b. Action Item List Review<br><i>Dennis Lu, PRS Chair</i>   |
| 9                  | <b>2024 Meeting Dates</b><br><i>Dennis Lu, PRS Chair</i>  |
| Break – 10:00 a.m. |   |
| 10                 | <b>Technical Presentation – OG&amp;E Misoperations</b><br><i>Ryan Einer, OG&amp;E Energy Corp and PRS Vice Chair</i>  |
| 11                 | <b>Setting Development and Commissioning Best Practices – ATC</b><br><i>Kevin Demeny, Senior Commissioning Engineer, ATC</i><br><i>Greg Sessler, System Protection Team Leader, ATC</i>   |
| 12                 | <b>Misoperations</b><br><i>John Grimm, Principal Systems Protection Engineer, MRO</i><br>2023 Update, Review and Discussion   |

## Meeting Agenda – Protective Relay Subgroup – Tuesday, March 12, 2024

---

### Agenda Item

Lunch – 12:00 p.m.

|    |  |
|----|--|
| 13 | <b>Q4 2023 Misoperations Review</b><br><i>John Grimm, Principal Systems Protection Engineer, MRO</i><br>a. Breakout Sessions |
| 14 | <b>PRS Member Roundtable</b><br><i>Dennis Lu, PRS Chair</i>  |
| 15 | <b>Other Business and Adjourn</b><br><i>Dennis Lu, PRS Chair</i>   |

**Call to Order and Determination of Quorum**

Determination of Quorum and Introductions

***Dennis Lu, Protective Relay Subgroup Chair***

| <b>Name</b>       | <b>Role</b> | <b>Company</b>                        | <b>Term</b> |
|-------------------|-------------|---------------------------------------|-------------|
| Dennis Lu         | Chair       | Manitoba Hydro                        | 12/31/26    |
| Ryan Einer        | Vice Chair  | OG&E Energy Corp.                     | 12/31/26    |
| Adam Daters       | Member      | ITC Holdings                          | 12/31/24    |
| Alex Bosgoed      | Member      | Saskatchewan Power Corporation        | 12/31/25    |
| Casey Malskeit    | Member      | Omaha Public Power District           | 12/31/25    |
| Cody Remboldt     | Member      | Montana-Dakota Utilities              | 12/31/24    |
| David Weir        | Member      | Western Area Power Administration     | 12/31/25    |
| Dylan Underwood   | Member      | Southwestern Power Administration     | 12/31/26    |
| Glenn Bryson      | Member      | American Electric Power               | 12/31/24    |
| Greg Hill         | Member      | Nebraska Public Power District        | 12/31/25    |
| Josh Erdman       | Member      | Xcel Energy                           | 12/31/24    |
| Lynn Schroeder    | Member      | Sunflower Electric Power Corporation  | 12/31/25    |
| Nathan Gulczynski | Member      | American Transmission Company         | 12/31/26    |
| Rochelle Trefry   | Member      | MidAmerican Energy Company            | 12/31/25    |
| Ryan Bissett      | Member      | Central Iowa Power Cooperative        | 12/31/26    |
| Sarah Marshall    | Member      | Alliant Energy                        | 12/31/24    |
| Scott Paramore    | Member      | Kansas City Board of Public Utilities | 12/31/24    |
| Tyler Porter      | Member      | Great River Energy                    | 12/31/26    |
| <b>Open</b>       | Member      |                                       | 12/31/25    |

**Call to Order and Determination of Quorum**

Robert's Rules of Order

***Dennis Lu, Protective Relay Subgroup 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<br><i>or</i><br>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.   |

## Meeting Agenda – Protective Relay Subgroup – Tuesday, March 12, 2024

---

|   |                       |     |   |
|---|-----------------------|-----|---|
| 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  |
|-------------------------------|---|--|
| 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.<br><br>“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. |

### 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.



## Meeting Agenda – Protective Relay Subgroup – Tuesday, March 12, 2024

---

**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.

**Standards of Conduct and Antitrust Guidelines**  
*John Grimm, Principal Systems Protection Engineer, 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 participant's 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.

**Safety Briefing**

*Shawn Keller, Outreach Coordinator, MRO*

**Action**

Information

**Report**

Shawn Keller will lead this agenda item.

**Chair's Remarks**

*Dennis Lu, Protective Relay Subgroup Chair*

**Action**

Information

**Report**

Chair Lu will provide an oral report during the meeting.

**New Members' Welcome Presentation**  
*Rebecca Schneider, Reliability Analysis Administrator, MRO*

**Action**

Information

**Report**

Rebecca Schneider will lead this agenda item.



MIDWEST  
RELIABILITY  
ORGANIZATION

# Midwest Reliability Organization

## New Member Welcome Presentation

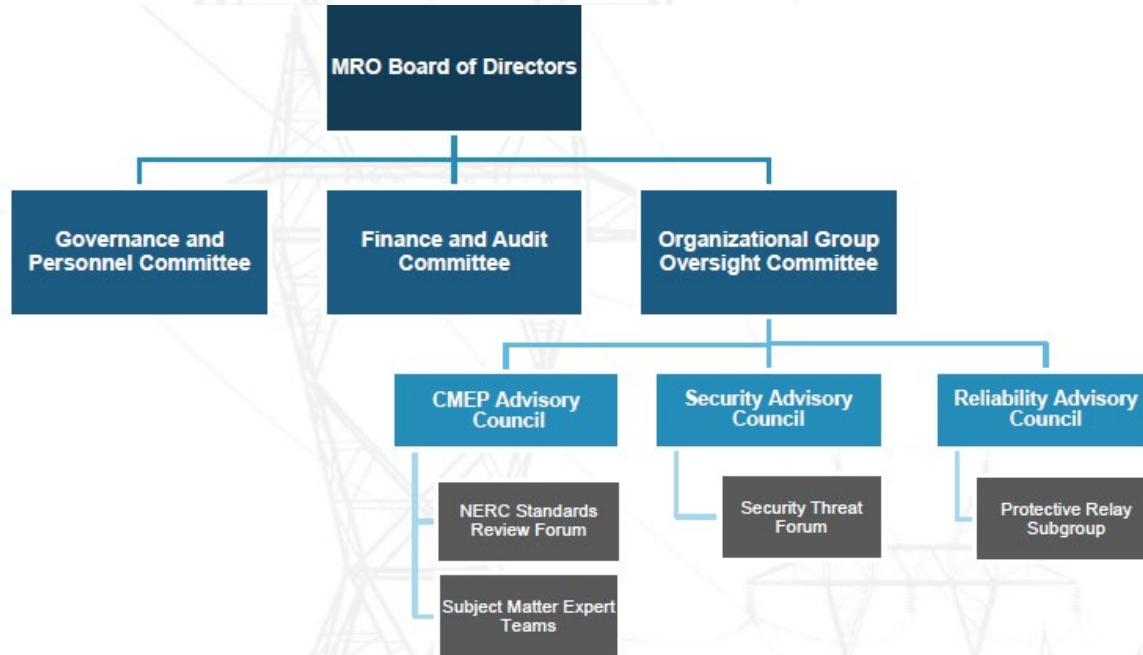
CLARITY

ASSURANCE

RESULTS

Public

# Advisory Council Structure



# Organizational Group Oversight Committee (OGOC)

- **The OGOC:**

- Establishes and oversees MRO organizational groups and policies applicable to organizational groups
- Ensures organizational groups are effective and efficient and do not duplicate the work of others
- Designates individuals to represent MRO on NERC organizational groups
- The Organizational Group Oversight Committee Charter is posted on [MRO's public website](#)





# OGOC 2024 Roster

| Member                              | Sector     | Company                               |
|-------------------------------------|------------|---------------------------------------|
| Ben Porath                          | COOP       | Dairyland Power Cooperative           |
| Darcy Neigum                        | <IOU       | Montana-Dakota Utilities              |
| Daryl Maxwell,<br><b>Vice Chair</b> | CU         | Manitoba Hydro                        |
| Dehn Stevens                        | IOU ≥ 3000 | MidAmerican Energy Company            |
| Eric Miller                         | TSO        | MISO                                  |
| Eric Schmitt                        | Ind.       | Independent Director                  |
| Iqbal Dhami                         | CU         | Saskatchewan Power Corporation        |
| Jeanne Tisinger                     | Ind.       | Independent Director                  |
| JoAnn Thompson,<br>Chair            | <IOU       | Otter Tail Power Company              |
| Maurice Moss                        | MU         | Kansas City Board of Public Utilities |



# Guiding Principles for Council Members

- **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. Regularly attend meetings of the group(s) on which the member serves.
  2. Competently prepare for, and be an active participant in, the meetings for the group(s) on which the member serves.
  3. Collaborate with other organizational group members in support of the mission, vision, and strategic initiatives of MRO.
  4. Support the Highly Effective Reliability Organization (HERO™) principles.



# Types of Diversity

## Inherent Diversity

- Race
- Ethnicity
- Age
- National origin
- Sexual orientation
- Cultural identity
- Assigned sex
- Gender identity

## Acquired Diversity

- Expertise (e.g., engineering, operations, security)
- Experience (e.g., executive, technical)
- Geography (e.g., US, Canada, north, south)
- Company (e.g., no more than two members from the same company per group)



# The Value of Diverse Teams

- **More focused on facts**
  - More likely to constantly reexamine facts and remain objective
  - Can lead to improved and more accurate group thinking
- **Facts are processed more carefully**
  - Considering the perspective of an outsider can result in improved decision-making and results
- **More innovative**
  - Diversity boosts intellectual potential
  - Conformity discourages innovative thinking

SOURCE: <https://hbr.org/2016/11/why-diverse-teams-are-smarter>



# MRO Reliability Advisory Council

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

<https://www.mro.net/organizational-groups/reliability-advisory-council/>



# RAC Council Membership

- **MRO's Council consists of 15 members:**
  - Pursuant to [Policy and Procedure 3: Establishment, Responsibilities, and Procedures of Organizational Groups and MRO Sponsored Representative on NERC Organizational Groups](#), membership on councils is based on experience and expertise.
  - No more than two members of the MRO RAC may be an employee of a single entity or affiliated entities.
  - At least three sectors will be represented on the MRO RAC. To the extent practicable, membership will reflect geographic diversity and balanced sector representation.
  - 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.



# MRO RAC 2024 Roster

| Member                         | Term End | Company                           |
|--------------------------------|----------|-----------------------------------|
| Andy Witmeier                  | 12/31/24 | MISO                              |
| Binod Shrestha                 | 12/31/25 | Saskatchewan Power Corporation    |
| Bryn Wilson, <b>Vice Chair</b> | 12/31/26 | Oklahoma Gas & Electric           |
| C.J. Brown                     | 12/31/24 | Southwest Power Pool              |
| Dallas Rowley                  | 12/31/25 | Oklahoma Gas & Electric           |
| Dick Pursley                   | 12/31/25 | Great River Energy                |
| Gayle Nansel, <b>Chair</b>     | 12/31/25 | Western Area Power Administration |
| Jason Weiers                   | 12/31/24 | Otter Tail Power Company          |
| Jeremy Severson                | 12/31/24 | Basin Electric Power Cooperative  |
| Mark Eastwood                  | 12/31/26 | City Utilities of Springfield, MO |
| Nandaka Jayasekara             | 12/31/25 | Manitoba Hydro                    |
| Open                           | 12/31/26 |                                   |
| Open                           | 12/31/26 |                                   |
| Open                           | 12/31/26 |                                   |
| Open                           | 12/31/24 |                                   |



# RAC Key Responsibilities

- Recommend the establishment of subgroups to support the Reliability Advisory Council 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 may be 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.



# RAC Key Responsibilities

- 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 and misoperation reviews.
- Support the applicable NERC program areas.
- The Reliability Advisory Council Charter can be found [here](#).



# 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 RAC are open to public attendance; however, the meeting may be called into closed 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: Establishment, Responsibilities, and Procedures of Organizational Groups and MRO Representation on NERC Organizational Groups.](#)
- Meeting costs incurred by RAC members are reimbursable by MRO according to [MRO Policy and Procedure 2: Expense Reimbursement.](#)

# Meeting/Event Dates

## Upcoming RAC Meeting Dates

| Meeting/Event          | Date  |
|------------------------|---|
| Quarter 1              | February 22, 2024                               |
| Reliability Conference | May 15, 2024                                    |
| Quarter 2              | May 16, 2024                                    |
| Quarter 3              | August 8, 2024                                  |
| Quarter 4              | October 3, 2024<br>Joint council meeting Oct. 2 |



# Guidelines for Meetings


- **Meeting Agendas:**

- Short agenda posted one month prior to meeting
- Agenda Packet posted one week prior to meeting

- **Meeting Minutes:**

- Support Staff/Liaison will review up to two weeks after meeting takes place
- Council will review for one week
- Council will vote to approve

# Work Plan



## MRO RAC 2024 Work Plan

| co | Work Item   | Source                               | Activity   | Timing       | Responsible Party | Item Audience | Item Type | Status | Notes   |
|----|---|--------------------------------------|--|--------------|-------------------|---------------|-----------|--------|---|
|    | Conduct outreach and awareness  | RAC Charter/MRO Strategic Priority 3 | Conduct a minimum of 2 webinars/outreach in 2024 to increase reliability and decrease risk to the reliable and secure operations of the bulk power system. Annual Reliability Conference, webinars- lessons learned, newsletter articles, Standard Application Guides                                    | Periodically | RAC Members       | OGOC          | Work Plan | Open   | The 2024 Reliability Conference is scheduled for May 15, 2024 in St. Paul, MN at the MRO office. A subgroup of RAC members will be formed to develop topics and speakers. The council will also be holding their annual Cold Weather Preparedness Workshop in Q4 and a Long Term Reliability Assessment Webinar in January of 2024.                                   |
| 2  | Provide Reliability Standard Reviews  | RAC Charter/MRO Strategic Priority 3 | Regular interface with other councils(CMEPAC and SAC) as it relates to standard development or standard application guidance. Look for opportunities to provide input from an Operational and Planning perspective.  | Periodically | RAC Members       | OGOC          | Work Plan | Open   | The RAC will continue to attend NSRF meetings periodically in 2024 with an assigned member as well as look at opportunities to provide guidance for standards relevant to operations and planning. In Q4 of 2024 MRO is planning to host a joint collaboration meeting similar to the previous year where the RAC, CMEPAC and SAC are able to meet together.          |
| 3  | Review significant events or disturbances on the BES                              | RAC Charter/MRO Strategic Priority 3 | Review of significant BES events and any resulting reports within the MRO Region and outside the region as relevant.   | Periodically | RAC Members       | OGOC          | Work Plan | Open   | The RAC will review any significant events or disturbances with a focus on the MRO region from a specific entity at quarterly meetings as necessary.  |
| 4  | Development of the MRO Regional Risk Assessment                                   | RAC Charter/MRO Strategic Priority 3 | Support the development of the annual MRO Regional Risk Assessment by identifying risks, trends and mitigating activities. Use the Risk Matrix tool to assess, quantify, and prioritize reliability risks. This also includes continuous improvement efforts regarding the Reliability Risk Matrix tool. | Qtr 4        | RAC Members       | OGOC          | Work Plan | Open   | MRO Staff and MRO RAC Members will discuss and prioritize potential regional risks annually to support the development of the MRO RRA. The RAC will also provide two resources to support MRO staff in ranking risks for the 2025 RRA utilizing the Reliability Risk Matrix.  |
| 5  | Support Regional representation on NERC organizational groups                     | RAC Charter                          | Review NERC Representative reports and provide guidance and feedback to the representatives. The RAC will continue to evaluate the need to follow specific NERC groups with representatives as the RSTC makes changes to the working group structure.  | Periodically | RAC Members       | OGOC          | Work Plan | Open   | MRO Staff and MRO RAC Members will look into any new working groups formed as well as existing working groups to determine the need to follow them. In 2024 the RAC will revisit the small teams initiative that was established to focus on each of the 5 NERC groups and help with engagement of the NERC Representative to potentially create more outreach ideas. |
| 6  | Review the summary of misoperations across the MRO Region (prepared by MRO staff) | PRS Charter                          | The Protective Relay Subgroup will review misoperations across the region to ensure that misoperations are effectively identified and mitigated.   | Periodically | PRS Members       | OGOC          | Work Plan | Open   | The PRS will look into potential lessons learned and targeted outreach for any misoperations. The group will also focus on regional misoperations during the quarterly meetings in a closed session where members perform an in-depth analysis in small breakout groups.  |
| 7  | Support the Inter-Regional Transfer Capability Study(ITCS)                        | RAC Charter                          | Inter-Regional Transfer Capability Support, Outreach, Review as needed.  | Periodically | MRO Staff         | OGOC          | Work Plan | Open   | This study is a directive from the Fiscal Responsibility Act of 2023 and must be filed with FERC by December 2, 2024. The RAC should receive quarterly updates on this initiative and look for opportunities to provide input to the study as subject matter experts of the MRO region.   |

The items above this row are seeking/have been granted OGOC approval. The items below this row are example ideas on how the advisory council could implement any approved work plan items.



# MRO Protective Relay Subgroup

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).

<https://www.mro.net/organizational-groups/reliability-advisory-council/protective-relay-subgroup/>



# Protective Relay Subgroup Membership

**MRO's PRS consists of 19 members:**

- Pursuant to [Policy and Procedure 3: Establishment, Responsibilities, and Procedures of Organizational Groups and MRO Sponsored Representative on NERC Organizational Groups](#), 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 specific experience and needs of the PRS are determined by the members.
- No more than one member of the PRS may be from the same company.



# MRO PRS 2024 Roster

| Member                        | Term End | Company                               |
|-------------------------------|----------|---------------------------------------|
| Adam Daters                   | 12/31/24 | ITC Holdings                          |
| Alex Bosgoed                  | 12/31/25 | Saskatchewan Power Corporation        |
| Casey Malskeit                | 12/31/25 | Omaha Public Power District           |
| Cody Remboldt                 | 12/31/24 | Montana-Dakota Utilities              |
| David Weir                    | 12/31/25 | Western Area Power Administration     |
| Dennis Lu, <b>Chair</b>       | 12/31/26 | Manitoba Hydro                        |
| Dylan Underwood               | 12/31/26 | Southwestern Power Administration     |
| Glenn Bryson                  | 12/31/24 | American Electric Power               |
| Greg Hill                     | 12/31/25 | Nebraska Public Power District        |
| Josh Erdman                   | 12/31/24 | Xcel Energy                           |
| Lynn Schroeder                | 12/31/25 | Sunflower Electric Power Corporation  |
| Nathan Gulczynski             | 12/31/26 | American Transmission Company         |
| Rochelle Trefry               | 12/31/25 | MidAmerican Energy Company            |
| Ryan Bissett                  | 12/31/26 | Central Iowa Power Cooperative        |
| Ryan Einer, <b>Vice Chair</b> | 12/31/26 | OG&E Energy Corp                      |
| Sarah Marshall                | 12/31/24 | Alliant Energy                        |
| Scott Paramore                | 12/31/24 | Kansas City Board of Public Utilities |
| Tyler Porter                  | 12/31/26 | Great River Energy                    |
| Open                          | 12/31/25 |                                       |





# PRS Key Responsibilities

- Develop, maintain, and implement regional procedures as needed that address the requirements of NERC PRC standards.
- Annually review the MRO summary of Misoperations to identify Lessons Learned and communicate 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.
- Provide technical input related to system protection and control to MRO.
- The Protective Relay Subgroup Charter can be found [here](#).



# Meetings

- The MRO PRS will meet quarterly or as necessary, in person or via conference call and/or web meeting.
- Meetings of the PRS are open to public attendance; however, the meeting may be called into closed 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: Establishment, Responsibilities, and Procedures of Organizational Groups and MRO Representation on NERC Organizational Groups](#)
- Meeting costs incurred by PRS members are reimbursable by MRO according to [MRO Policy and Procedure 2: Expense Reimbursement](#)

# Meeting Dates

## Upcoming PRS Meeting Dates

| Meeting/Event | Date               |
|---------------|--------------------|
| Quarter 1     | March 12, 2024     |
| Quarter 2     | June 11, 2024      |
| Quarter 3     | September 10, 2024 |
| Quarter 4     | December 10, 2024  |

# Important Links

RAC mailing list: [mrorac@mro.net](mailto:mrorac@mro.net) Please be sure to whitelist

PRS mailing list: [mroprs@mro.net](mailto:mroprs@mro.net) Please be sure to whitelist

RAC Public Site: <https://www.mro.net/organizational-groups/reliability-advisory-council/>

PRS Public Site: <https://www.mro.net/organizational-groups/reliability-advisory-council/protective-relay-subgroup/>

Expense Reimbursement: [MRO Policy and Procedure 2: Expense Reimbursement](#)

Member Responsibilities: [MRO Policy and Procedure 3: Establishment, Responsibilities](#)

Confidentiality Policy: [MRO Policy and Procedure 5: Confidentiality Policy](#)



# MRO Contact Information

**MRO Website:** [mro.net](http://mro.net)

380 St. Peter Street, Suite 800

Saint Paul, MN 55102

Phone: 651-855-1760 (main)

**MRO Support Staff**

**Rebecca Schneider**

Reliability Analysis Administrator

Phone: 651-855-1740

[Rebecca.schneider@mro.net](mailto:Rebecca.schneider@mro.net)

**MRO RAC Support Staff**

**Bryan Clark**

Director of Reliability Analysis

Phone: 651-256-5171

[Bryan.clark@mro.net](mailto:Bryan.clark@mro.net)

**MRO PRS Support Staff**

**Jake Bernhagen**

Manager of Reliability Performance

Phone: 651-256-5177

[Jake.bernhagen@mro.net](mailto:Jake.bernhagen@mro.net)

**MRO PRS Support Staff**

**Sarah Wernette**

Sr. Systems Protection Engineer

Phone: 651-251-5387

[Sarah.wernette@mro.net](mailto:Sarah.wernette@mro.net)



**Consent Agenda**  
*Dennis Lu, Protective Relay Subgroup Chair*

**Action**

Approve the consent agenda, which includes Q4 2023 Meeting Minutes.

**Report**

The consent agenda includes draft minutes from the meeting held on December 6, 2023. The meeting minutes as written start on the next page.



## Draft Minutes of the Protective Relay Subgroup Meeting

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

*Wednesday, December 6, 2023, 9:01 a.m. to 3:22 p.m. Central*

*Notice for this meeting was electronically posted to the [MRO website](#) on November 9, 2023.  
A final agenda, including advanced reading materials, was also posted on November 29, 2023.*

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

Protective Relay Subgroup (PRS) Chair Ryan Einer called the meeting to order at 9:01 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

MRO Outreach Coordinator, Shawn Keller, presented a safety video illustrating the steps to take if various emergency situations are encountered onsite at MRO.

#### 4. Chair's Remarks

Chair Einer reviewed agenda items including upcoming presentations by American Transmission Company (ATC) and NERC. Einer also acknowledged MRO Senior Systems Protection Engineer, Sarah Wernette, who is expected to replace Jake Bernhagen as the MRO PRS liaison sometime in 2024.

#### 5. Consent Agenda

The PRS reviewed the consent agenda, which included minutes from the September 6, 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).*

John Grimm, MRO Principal Systems Protection Engineer, provided an SPCWG update on behalf of Lynn Schroeder, who was unable to attend. Notably the position paper related to FERC Order 881 has been posted for industry. The PRC-024 IBR Whitepaper draft was finalized and sent to NERC. Writing assignments are in progress for the Technical Reference related to maintenance for ethernet-based protection and control (P&C). PRC-006 standard authorization request (SAR) comments were provided to the System Planning Impacts from DER Working Group (SPIDERWG). Two face-to-face meetings are planned in 2024, one in Atlanta (April) and one in Salt Lake City (September).



### *SPCWG Position Paper on FERC Order 881*

Grimm gave an overview of SPCWG's position on FERC Order 881 as it relates to PRC-023. SPCWG Chair and PRS member, Lynn Schroeder, provided the written presentation but was unable to attend the meeting. Discussion ensued.

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

Bernhagen provided an update from the November 7, 2023, meeting. Minor Section 1600 revisions will be made to the Transmission Availability Data System (TADS) and Generator Availability Data System (GADS) reporting fields. The MIDAS website will be updated, and a new spreadsheet will be posted after 2023 reporting is complete. The Misoperation Impact Score metric was also discussed. The group discussed misoperations without a fault and how they can disproportionately impact an entity's misoperation rate. However, it was decided not should not be excluded from the misoperation rate calculation and that the calculation should remain as it is for now. Discussion ensued.

### *Transmission Availability Data System (TADS).*

John Grimm, MRO Principal Systems Protection Engineer, provided an update on TADS. Grimm reported that in person training was held in Atlanta in October 2023. The addition of technical data to TADS inventory has been put on hold. A high percentage of entities completed the TADS reporting that was due in November. Grimm noted the upcoming TADS User Group meeting.

## **7. PRS Business**

### *Updates.*

Bernhagen welcomed and introduced MRO Senior Systems Protection Engineer, Sarah Wernette, and noted that he plans to transition her into the role of PRS liaison sometime in 2024.

Bernhagen shared that all PRS member nominations for 2024 were approved by the OGOC, and the new terms are starting in January. He mentioned that the Chair and Vice Chair roles will be determined early in 2024 and anyone interested in leadership should reach out to him.

### *Action Item List Review.*

Chair Einer reviewed the action item list and updates were made accordingly.

## **8. 2024 Meeting Dates**

Chair Einer reviewed the proposed 2024 meeting dates for the PRS and the other councils and subgroups.

## **9. Technical Presentation**

### *ATC 2023 Q2 Misoperation Review*

Ethan Grindle, Substation Technology Technical and Compliance Engineer, ATC, gave a presentation regarding a misoperation that took place in the RF region caused by unexpected negative sequence currents in a weak area of the ATC system. The abnormal currents resulted in a Directional Comparison Blocking (DCB) scheme relay incorrectly opening a breaker. The corrective actions included performing a fault study on the line, updating the ground overcurrent time delay from one





cycle to seven cycles, and reviewing the other three terminal lines for similar coordination issues. Discussion ensued.

## **10. NERC Standards Update**

Rich Bauer, Associate Principal Engineer, North American Electric Reliability Corporation (NERC) gave a presentation on Protection Related Standards projects. Bauer discussed the reprioritization of standards projects as a result of FERC Order 901 related to inverter-based resources (IBRs). NERC's website now categorizes the projects as high, medium, and low priority.

## **11. Misoperations**

### *Q3 2023 Update, Review and Discussion*

Bernhagen provided a summary of MRO's third quarter 2023 misoperations data. Overall, the misoperations rate is trending downward, getting MRO closer in line with the NERC five-year average. Incorrect Settings accounted for the highest number of misoperations by cause in the third quarter, making up almost one-third of the total number.

There was discussion around misoperation considerations when a fault occurs on a non-BES transmission line, but the line protection operates BES breakers. Bernhagen noted a need for better examples in the MIDAS data reporting instructions (DRI) to address this concern. PRS member, Cody Remboldt and Bernhagen will provide a draft illustration for the DRI to the MIDASUG for their consideration.

### *Review NERC Lessons Learned*

Bernhagen noted two recent Lessons Learned posted on NERC's website. The topics included Loss of Communications to Transmissions Substations and Wind Turbine Generation Loss due to Unexpected and Insufficient Ride-through Performance.

## **12. PRS Roundtable Discussion**

Chair Einer invited member participants to share other relevant industry observations. Topics discussed included Remedial Action Schemes (PRC-012-2), fiber communications, and the NERC Misoperation Reduction Workshop in Atlanta on October 25-26, 2023.

## **13. Q3 2023 Misoperations Review**

### *Breakout Sessions*

The PRS members reviewed the third 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 3:22 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                               |
| 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     |
| David Wheeler         | Southwestern Public Services Co.      |
| Greg Hill             | Nebraska Public Power District        |
| Greg Sessler          | American Transmission Company         |
| Josh Erdman           | Xcel Energy                           |
| 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    |
| Shawn Keller          | Outreach Coordinator                  |
| John Grimm            | Principal Systems Protection Engineer |
| Eric Graftaas         | Principal Power Systems Engineer      |
| Sarah Wernette        | Senior Systems Protection Engineer    |
| Max Desruisseaux      | Senior Power Systems Engineer         |
| Max Vang              | IT Support Analyst                    |



| Other Attendees |                               |
|-----------------|-------------------------------|
| Name            | Company                       |
| Allen Halling   | Evergy                        |
| Barbara Marion  | Nextera Energy                |
| Calin Rhymer    | Dairyland Power Cooperative   |
| Ethan Grindle   | American Transmission Company |
| Rich Bauer      | NERC                          |
| Justin Fuith    | Pro Tech Power                |
| Tyler Baxter    | Corn Belt Power Cooperative   |
| Tyler Porter    | Great River Energy            |

**NERC Activities**

a. NERC SPCWG Update

*Lynn Schroeder, Sunflower Electric Power Corporation and PRS Member*

**Action**

Information

**Report**

Lynn Schroeder will provide an oral report during the meeting.

**NERC Activities**

b. NERC MIDASUG Update

*John Grimm, Principal Systems Protection Engineer, MRO*

**Action**

Information

**Report**

John Grimm will provide an oral report during the meeting.

**NERC Activities**

c. Transmission Availability Data System (TADS)

***John Grimm, Principal Systems Protection Engineer, MRO***

**Action**

Information

**Report**

John Grimm will provide an oral report during the meeting.

**PRS Business**

a. Updates

*John Grimm, Principal Systems Protection Engineer, MRO*

**Action**

Information

**Report**

John Grimm will provide an oral report during the meeting.

**PRS Business**

b. Action Item List Review

*Dennis Lu, Protective Relay Subgroup Chair*

**Action**

Discussion

**Report**

Chair Lu will lead this discussion during the meeting.



**2024 Meeting Dates**  
*Dennis Lu, Protective Relay Subgroup Chair*

**Action**

Information

**Report**

Chair Lu will lead this agenda item.

|        | Q1 2024         | Q2 2024 | Q3 2024 | Q4 2024 |
|--------|-----------------|---------|---------|---------|
| RAC    | 2/22            | 5/16    | 8/8     | 10/3    |
| SAC    | 2/21            | 5/14    | 8/6     | 10/3    |
| CMEPAC | 2/20<br>Virtual | 5/7     | 7/23    | 10/3    |
| PRS    | 3/12            | 6/11    | 9/10    | 12/10   |
| OGOC   | 3/6<br>Virtual  | 5/22    | 8/20    | 11/6    |
| BOD    | 2/8<br>Virtual  | 5/23    | 8/22    | 11/7    |

**\*Joint council meeting  
10/2/24 PM**

**MRO CONFERENCE DATES 2024**

|    |   |
|----|---|
| Q1 | RAM Conference: March 20, 2024, <b>Virtual conference</b>   |
| Q2 | Reliability Conference: May 14–15, 2024, <b>Social networking event and conference (hybrid); St. Paul, MN</b> |
| Q3 | CMEP Conference: July 23–24, 2024, <b>Social networking event and conference (hybrid); Kansas City, MO</b>    |
| Q4 | Security Conference: October 1–2, 2024, <b>Social networking event and conference (hybrid); St. Paul, MN</b>  |

**OTHER CONFERENCE DATES 2024**

GridSecCon: October 22–25, 2024 (Co-hosted by NERC E-ISAC and MRO); **Minneapolis Hyatt Regency, Minneapolis, MN**

**Technical Presentation – OG&E Misoperations**  
*Ryan Einer, OG&E Energy Corp and PRS Vice Chair*

**Action**

Information

**Report**

Vice Chair Einer will provide an oral report during the meeting.

**Commissioning Lessons Learned – American Transmission Company**  
*Kevin Demeny, Senior Commissioning Engineer, ATC*  
*Greg Sessler, System Protection Team Leader, ATC*

**Action**

Information

**Report**

American Transmission Company will provide an oral report during the meeting.

# Setting development and commissioning best practices

**PRESENTED BY:**

Kevin Demeny and Greg Sessler

March 12, 2024

- ATC Proprietary -

[atcllc.com](http://atcllc.com)

# Introducing ATC

- Wisconsin-based company
- Operating 10,000+ miles of lines & 580+ substations in Wisconsin, Michigan, Minnesota, and Illinois
- Over 5 million electric consumers in service area
- Over 500 employees



# ATC System Protection



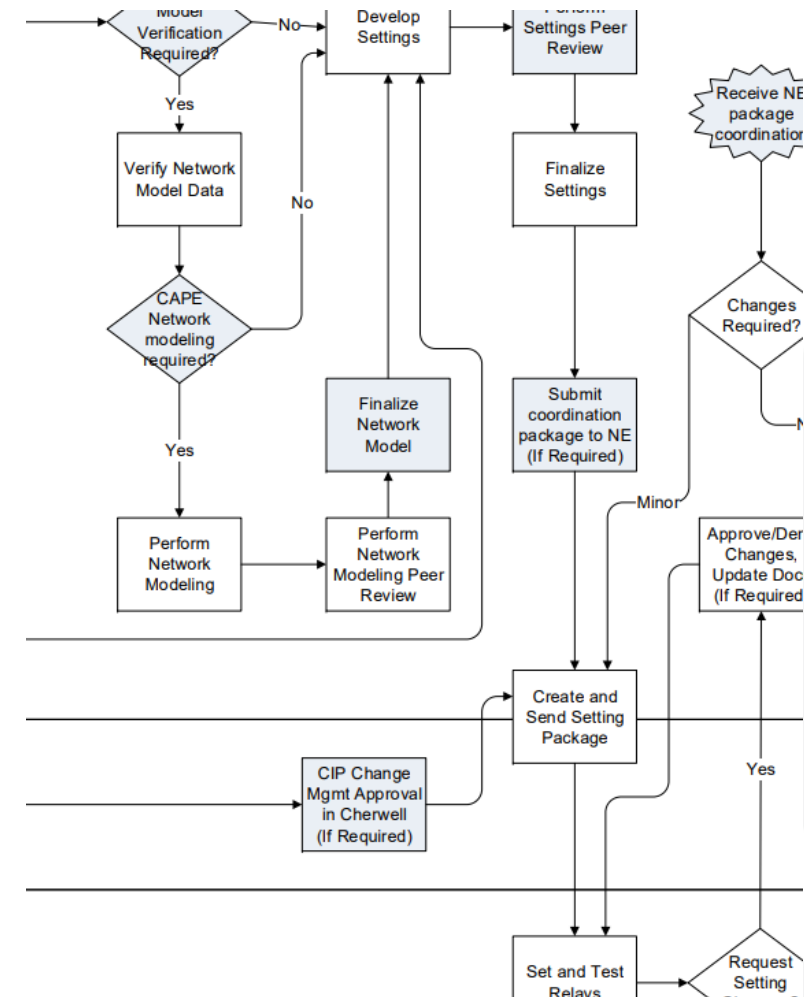
- Responsibilities
  - Capital construction projects
  - 24 x 7 Operational support / on-call
  - Standards development (drawings, settings)
  - Compliance
- Staff - 11 engineers, 4 specialists, 2 team leads
  - Protection experience has decreased over last few years
  - Increased use of staff augmentation / EPC protection contractors

# Relay setting development

*What do we do in the office impacts commissioning*

# Setting process and controls

- Relay setting process
  - Documented, repeatable
  - Recently refined for PRC-027
  - Many tasks, not all compliance-related
- Identified need for tool
  - Flexible / user friendly
  - Track setting process to completion
  - Gather data (evidence)
  - Provide oversight





# Setting process and controls

- Cherwell
  - Electronic relay setting process tool
    - ◆ Setting change management
  - Software already in use at ATC

**P4 CHANGE 118638 (Standard)**  
MKN-MCGULPIN 9903 - 8/11/2022 9:46 AM

STATUS: Execution  
REQUESTOR: [Redacted]  
OWNED BY: [Redacted]  
Next: Execution Completed  
System Protection

Created: [Redacted]  
Last modified: 8/11/2022 10:17 AM

Overview | Configuration Items (2) | Activity | Current Reviewers | Tasks | Answered Questions | Related Change | Incidents | Problems

New Task | Record 6 of 56 | View

| Task Order | Owned By Team     | Owned By           | Status | Title                                    | CI Name     | CI Alias                | Due Date  | Closed Date Time   |
|------------|-------------------|--------------------|--------|--|-------------|-------------------------|-----------|--------------------|
| 1          | System Protection | Gulczynski, Nathan | Closed | Verify BESElement                        |             |                         |           | 8/11/2022 10:17 AM |
| 2          | System Protection | Gobin, Patty       | Open   | Create initial 5030 DOR settings         | RLY-030-653 | MKN - 9903 - SEL 311L   |           |                    |
| 2          | System Protection | Gobin, Patty       | Open   | Create initial 5030 DOR settings         | RLY-031-157 | MKN - 9903 - SEL 411L-1 |           |                    |
| 3          | System Protection | Gobin, Patty       | Open   | Update 5030 and IMS                      | RLY-030-653 | MKN - 9903 - SEL 311L   |           |                    |
| 3          | System Protection | Gobin, Patty       | Open   | Update 5030 and IMS                      | RLY-031-157 | MKN - 9903 - SEL 411L-1 |           |                    |
| 5          | System Protection | Gulczynski, Nathan | Open   | Initiate contact with Neighboring Entity |             |                         |           |                    |
| 7          | System Protection | Gulczynski, Nathan | Open   | Initiate RAS modification process        |             |                         |           |                    |
| 6          | System Protection | Gulczynski, Nathan | Open   | Update NE Workplan                       |             |                         |           |                    |
| 8          | System Protection | Gulczynski, Nathan | Open   | Verify Network Model Data                |             |                         |           |                    |
| 9          | System Protection | Gulczynski, Nathan | Open   | Perform CAPE Modeling                    |             |                         | 8/25/2022 |                    |
| 11         | System Protection | Gulczynski, Nathan | Open   | Peer Review (Planning): Network Modeling |             |                         |           |                    |

## Additional Questions

Based on the Service classification, there may be additional information to gather.

Project Name

MKN-MCGULPIN 9903 - 8/11/2022 9:46 AM

Work Order Number \*

604333

## Scope of Change

1. Is Neighboring Entity Coordination required as part of this project?

2. Is RAS Modification Required as part of this project?

3. Is Network Model Verification required as part of this project?

4. Is a UPLC included in this element?

5. Is an SES Station affected as part of this element?

6. Is a Contract Engineer the protection lead?

7. Is this a minor setting change?

# Setting process – peer review

- Peer review
  - Completed for all changes
    - ◆ By ATC or staff augmentation engineer
  - Peer review checklist
    - ◆ Consistent, documented review
    - ◆ Includes things we have learned over time
    - ◆ By application – line, bus, transformer...

|  |                     |  |          |
|--|---------------------|--|----------|
|  | Substation 1:       | Crivitz  |          |
|  | Relay types:        | 421  |          |
|  |                     | Check box (x) if no issues   | Comment  |
| Line Protection Peer Review  | Comment Type        | Comments   | Response |
| Verify that the line impedance & length settings match the CAPE line model impedance & length data.  | Minor Setting Issue | The adjacent Sandstone - High Falls U-99 line's impedance is 5.87 ohm, not 5 ohm   | Updated  |
| Read through settings document to understand compromises in coordination, special conditions, etc. Specifically verify that description matches highlighted fields and that any red verification checks (miscoordination flags) are fully explained. | Minor Setting Issue | I would not used the Zappmin from the line-end fault with strong source OOS. This fault is optional and produced for sequential tripping. If the remote breaker opens first, Z1 would not overreach. I would use the scenario when the mutually coupled line U-99 is OOS and grounded. | Updated. |
| Verify CAPE contact logic with the "Manually Assign Logic to LZOP Elements" field in the LZOP Trip expression window.  | Non-setting Issue   | Please remove Zone 4 elements from the relay contact logic in CAPE LZOP.   | Updated. |

# Setting process – setting verification

- Verifications performed by protection specialist
- To be issued settings verification
  - Verify documentation matches SEL-5030 setting file
    - ◆ Excel import/export rdb macros
  - Creates “Document of Record Verified” setting state
- As-left setting verification
  - Remote comparison of settings
    - ◆ Also verifies connectivity, passwords, CIP requirements
  - After testing completion and before placing relay in-service

# Template drawings and settings

- Template drawings and settings for all schemes
  - Consistent application of schemes (logic, philosophy, I/O)
- Template settings
  - Excel-based with some automation
  - Template for each application (single breaker 411L, dual breaker 421, 487B bus differential)
  - Limited manual entry and setting verifications
    - ◆ Trip limit calculation - warning if less than facility rating or PRC-023
    - ◆ High SIR – check zone 1 reach warning
    - ◆ Communication scheme coordination ( $Z3P_{\text{calculated}} > \text{remote } Z2P \text{ w/margin}$ )
  - Includes setting guidance / philosophy

# Template settings

387\_Template\_2022\_Mar 1 Setup

Local Substation Acronym:

Transformer Name:

**High Side**

Bus Voltage (kV):

Breaker Arrangement:

Breaker #1 Number:

Breaker #2 Number:

**Low Side**

Bus Voltage (kV):

Breaker Arrangement:

Breaker #1 Number:

Breaker #2 Number:

Date:

### Relay Configuration Details

#### Local Relay Terminal Configuration

|  |        |
|--|--------|
| Local Terminal Breaker Configuration                   | Double |
| Loss of Potential Tripping Required?                   | No     |
| Relay Potentials Sourced From Line Side of Breaker(s)? | Yes    |
| Relay Potentials Sourced From Line Side of MOD?        | No     |

#### Remote Relay Terminal Configuration

|   |        |
|---|--------|
| Remote Terminal Breaker Configuration                 | Double |
| Remote Terminal - Line Terminates into a Transformer? | No     |
| Remote CTR Matches Local CTR?                         | No     |
| Communication Scheme Utilizes a SEL-321 Relay?        | No     |

#### Protection Channel Details

|   |                                   |
|---|-----------------------------------|
| Relay Protection Channel Type =                               | Directional Comparison Unblocking |
| Mirrored Bit Rx/Tx Configuration                              | Master                            |
| Primary and Secondary Relaying Comm Channels Fully Redundant? | No                                |

#### Area Inverter Based Resource Details

|                                   |    |
|-----------------------------------|----|
| Inverter Based Resource Tie-Line? | No |
|-----------------------------------|----|

|  |      |                       |
|--|------|-----------------------|
| Under an N-0 or N-1 scenario, during a forward fault will currents seen by this relay be sourced solely by inverter based resources? | No   |                       |
| Maximum nameplate fault contributions of IBRs behind this relay during this scenario (sum contributions if multiple IBRs)            | 0.00 | MVA<br>A <sub>o</sub> |

|  |      |                       |
|--|------|-----------------------|
| Under an N-0 or N-1 scenario, during a reverse fault will currents seen by this relay be sourced solely by inverter based resources? | No   |                       |
| Maximum nameplate fault contributions of IBRs in front of this relay during this scenario (sum contributions if multiple IBRs)       | 0.00 | MVA<br>A <sub>o</sub> |

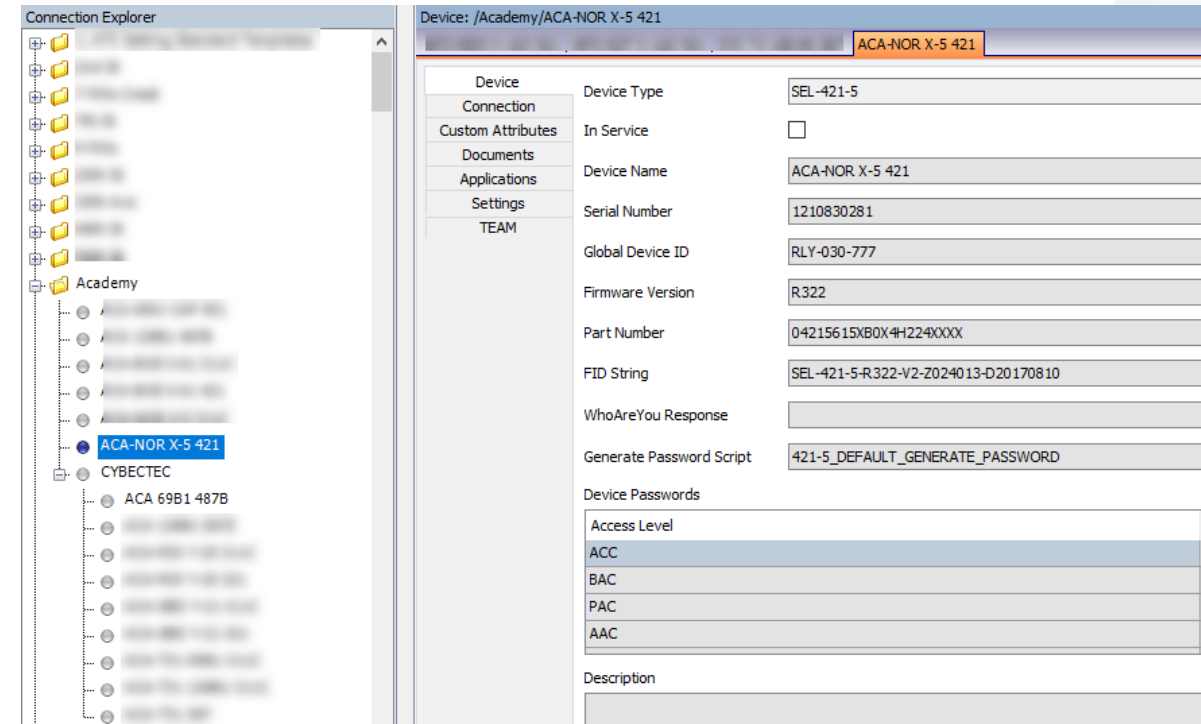
#### Direct Transfer Transmit Details

|   |     |
|---|-----|
| Direct Transfer Trip Transmit Required? | Yes |
|---|-----|

|  |     |
|--|-----|
| Direct Transfer Trip Receive Required? | Yes |
| 94L Scheme Provided?                   | No  |

# Setting database

- SEL-5030 Device Manager
  - Directory of relays
  - Remote communication
  - Setting history with setting states
  - AcSELeator editor
- Database of relay attributes / settings
  - Integration with other databases
  - Setting and relay attribute query



| Version History  |         |               |                      |              |                                       |  |  |
|--|---------|---------------|----------------------|--------------|---------------------------------------|--|--|
| <input type="checkbox"/> State                               | Version | Settings Type | Saved                | Saved By     | Comment                               |  |  |
| <input type="checkbox"/> As Left-Document of Record Verified | 0.4     | SEL-421-5 024 | 10/8/2021 4:13:30 PM | pgobin.esd   | As Left - DOR Verified. WO 603796 PCG |  |  |
| <input type="checkbox"/> Issued-Document of Record Verified  | 0.3     | SEL-421-5 024 | 9/8/2021 3:03:48 PM  | pgobin.esd   | Issued - DOR Verified. WO 603796 PCG  |  |  |
| <input type="checkbox"/> Peer Review                         | 0.2     | SEL-421-5 024 | 8/18/2021 5:11:01 PM | egrindle.esd |                                       |  |  |
| <input type="checkbox"/> Draft                               | 0.1     | SEL-421-5 024 | 8/18/2021 4:56:39 PM | egrindle.esd | June 24, 2021 Template...             |  |  |

# Commissioning

# ATC Commissioning

- Support capital projects and maintenance activities
  - Commissioning plan
    - Project scoping and sequencing
  - Contractor management
- ATC Staff – 8 engineers (1 open position), 1 team lead, 0 technicians
- Contractor management
  - Manage local distribution company (5) and alliance contractors (2)



# ATC Commissioning

## Step 1 Details

### Scope Of Work To Be Completed

#### ATC Scope:

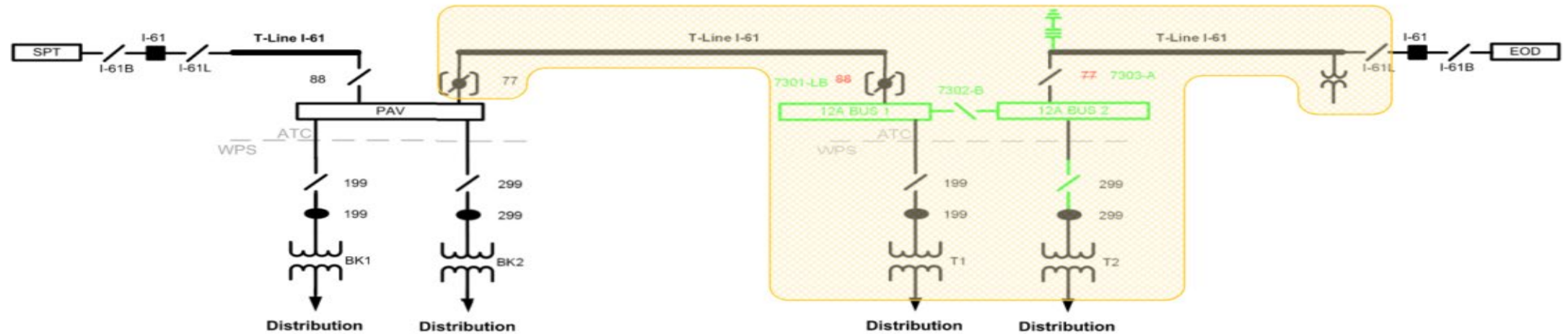
- Replace existing bus section
- Install new bus tie switch
- Install new vertical bus and insulators
- Install new RTU and IO module in the existing MOD panel
- Install new MOD router in the existing MOD panel
- Install new WPS 299 switch
- Install new line arresters on line side of the 77 switch

#### WPS Scope:

- Remove AMR, RTU/HMI, feeder panel
- Install RTU & comms
- Install new 299 switch
- Install new 241 feeder panel
- Install new 241 low side breaker

|   |                 |
|---|-----------------|
| ■ | Start Date      |
| ■ | Duration Dates  |
| ■ | Completion Date |
| ■ | One Day Outage  |

# ATC Commissioning



**Step 1**

# Commissioning HP Tools

# Tools in the Field

- Core element to Commissioning
  - Pre-job Briefs

# Pre-job Brief

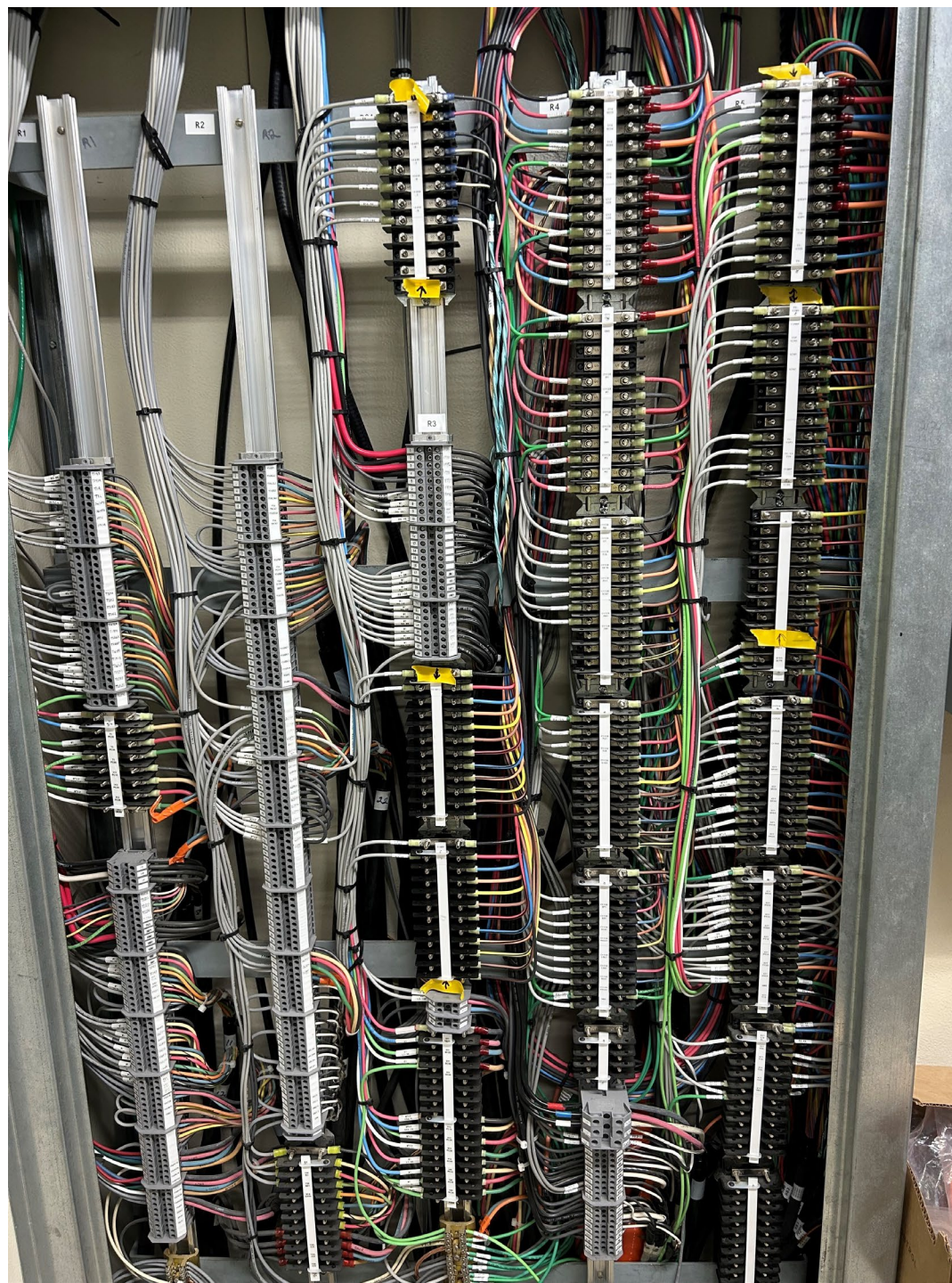
| Zone of Protection/Energized Work – Use Proper Testing Equipment   |  |   |
|--|--|---|
| Clearance Order Reviewed   | X Yes <input type="checkbox"/> N/A   | Minimum Approach Distance Requirements _____  |
| Clearance Order #'s  | 23-01686   |   |
| Line/Feeder Circuit #  | BUS 6  |   |
| Equipment Lock Out Tag(s) Needed   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A   | Equipment # PER CLR ORD above   |
| Equipment Lock Out Tag(s) Placed   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A   | Identified All Potential Energy Sources, Including Backfeed <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A  |
| Hot Line Clearances (One Shot) <input type="checkbox"/>  | Zone of Protection: <input checked="" type="checkbox"/> Identified <input checked="" type="checkbox"/> Accepted <input checked="" type="checkbox"/> Established <input checked="" type="checkbox"/> Reviewed location of grounds |   |
| Vehicles Grounded <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A   | System Grounds <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A  | Working Grounds <input type="checkbox"/> Yes <input checked="" type="checkbox"/> N/A Tested DeEnergized? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A |
| Number of Grounds  | __ MPS   | Identified and Discussed All Points of Potential Energy Release (Gas, Steam, Mechanical, etc) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> N/A            |
| Control Center Notified <input checked="" type="checkbox"/> You must call the System Control Operator to request clearance. Pewaukee: 1) WE North-(877) 402-5227, 2) WE South-(877) 402-5228, 3) WPS/UPPCO-(877) 977-8726, Cottage Grove (ALT/MGE/WPS West) -(800) 937-3762. |  |   |
| Crews informed that personnel having the protective clearance shall remain on job site while work is performed in the Zone of Protection. <input type="checkbox"/>   |  |   |
| Special Precautions (Check ALL that Apply)   |  |   |
| <input checked="" type="checkbox"/> Hazard Above You   | <input checked="" type="checkbox"/> Trenches and Excavations   | <input checked="" type="checkbox"/> Hot/Cold Weather Concerns   |
| <input checked="" type="checkbox"/> Equipment Operation  | <input type="checkbox"/> Test Rubber Gloves (Sleeves)  | <input checked="" type="checkbox"/> Tool Check (Condition, Right for Job)   |
| <input type="checkbox"/> Pole Condition  | <input type="checkbox"/> Winch Line/Buckets  | <input type="checkbox"/> Inspect Line Hose/Blankets/Hotsticks   |
| <input type="checkbox"/> Rubber Goods Required   | <input type="checkbox"/> Fall Protection Plan  | <input checked="" type="checkbox"/> Other Work Groups in Area Identified  |
| <input type="checkbox"/> Fire Suppression System   | <input type="checkbox"/> Inspection of Hydraulics, Cables & Controls   |   |
| Other Special Precautions (Include Details: Note Type, Placement and Number of Rubber Goods Used)  |  |   |
| <u>Panels with live in-service circuits:</u>   |  |   |
| Work Area Protection (Check ALL that Apply)  |  |   |
| <input checked="" type="checkbox"/> Barriers Placed  | <input type="checkbox"/> Signs Placed  | <input type="checkbox"/> Public and Pedestrian Safety in Place  |
| <input type="checkbox"/> Flaggers Being Used   | <input type="checkbox"/> Street Permits in Place/Reviewed  |   |
| <input type="checkbox"/> Spotters Used for Vehicle Movement and aerial work  |  |   |
| Traffic Hazards <input type="checkbox"/>   | Traffic Flow Direction Discussed <input type="checkbox"/>  | Traffic – Heavy <input type="checkbox"/> Traffic – Light <input type="checkbox"/>   |
| Job Task (Check ALL that Apply)  |  |   |
| <input checked="" type="checkbox"/> Job Assignments  | <input checked="" type="checkbox"/> Safe Working Techniques  | <input checked="" type="checkbox"/> Proper PPE Worn   |
| <input checked="" type="checkbox"/> Review Job Assignments on Site   | <input checked="" type="checkbox"/> Lifting, Twisting, Bending, Stretching   | <input type="checkbox"/> Pre-Flight Inspection  |
| <input type="checkbox"/> Review Rules to Dig By  | <input type="checkbox"/> Confirm Proper Excavation   | <input type="checkbox"/> Check for Correct Phases   |
| <input type="checkbox"/> Notified Digger's Hotline   | Confirmation # (if needed)   |   |

# Tools in the Field

- Core element to Commissioning
  - Flagging/Operational Barriers



# Flagging





# Operational Barrier

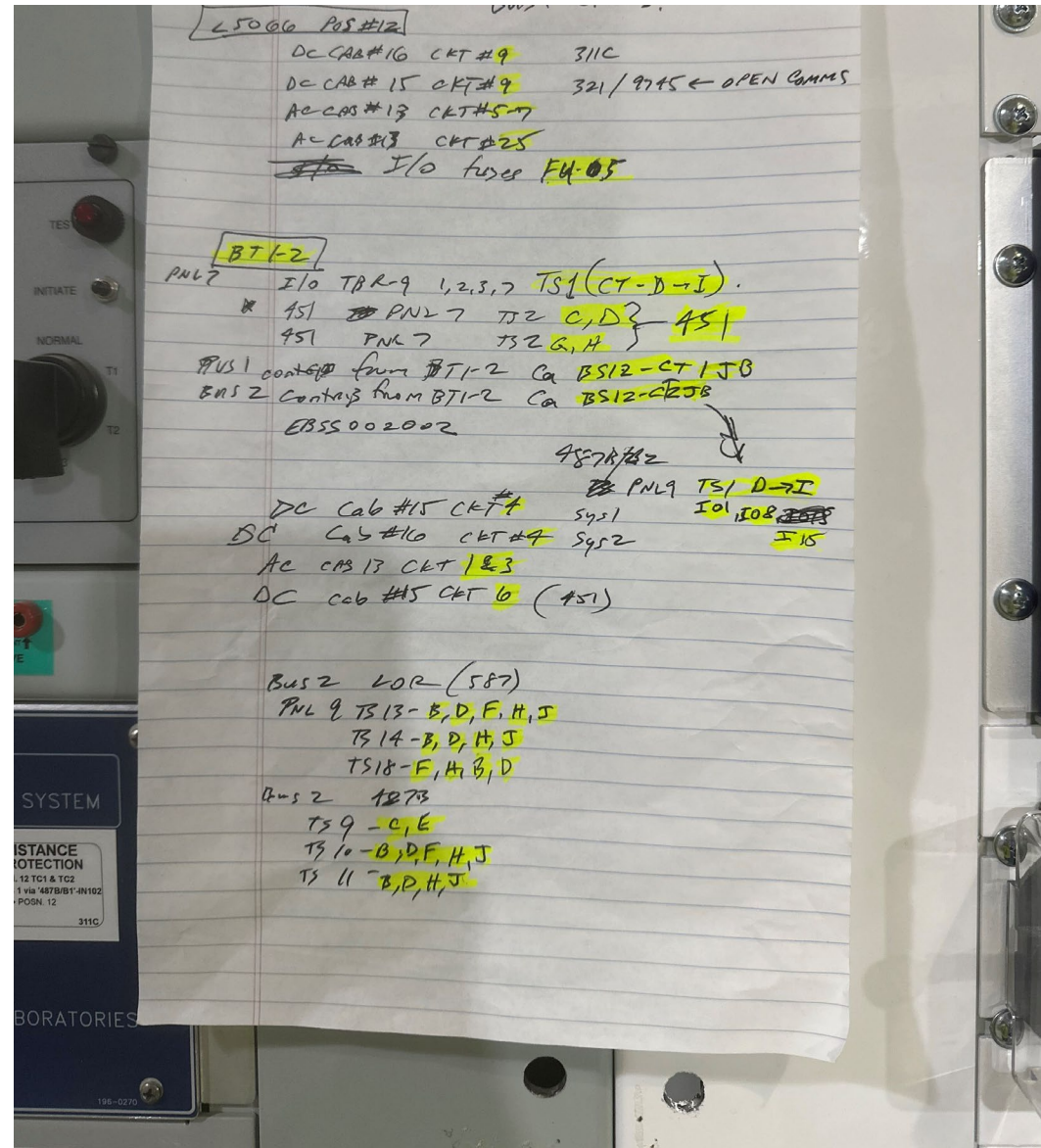




# Tools in the Field

- Core element to Commissioning
  - Peer Check/Review
  - Isolation Logs

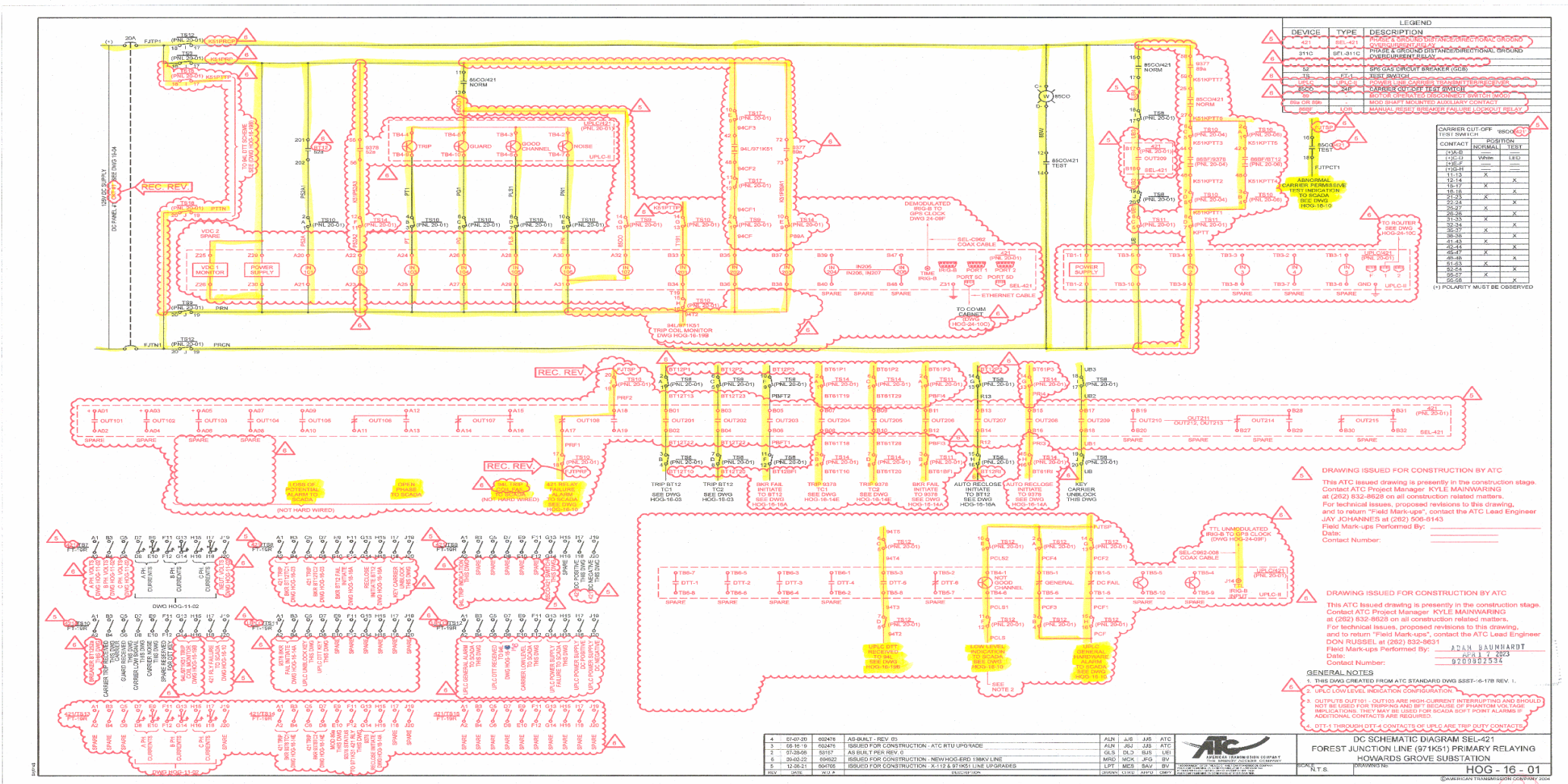
# Isolation Log



# Tools in the Field

- Core Element to Commissioning
  - Questioning Attitude/Stop When Unsure
  - Three Part Communication
  - Phonetic Alphabet
  - STAR (Stop, Think, Act, Review)
  - Placekeeping

# Yellowline



# HP Focus

- HP/GC/NM Presentation At Safety Call
  - Held Weekly
  - Rotate Bi-monthly Between Contractors

# Good Catch/Near Miss

- Commissioning Track GC/NM
  - Quarterly Metric based on total submittals and hours worked

# Good Catch/Near Miss



Report V59 Last Refreshed 2/19/2024

[Good Catch and Near Miss definitions](#)

Good Catches identify and correct a hazard to prevent a potential incident while Near Misses are unplanned events that didn't result in an incident but had the potential to do so

📅 This Calendar Year

📅 Last Calendar Month

↶ Reset Filters

39  
Good Catch

(Blank)  
Near Miss

39  
Submissions

1/1/2023

12/31/2023



Type

All

Company Group, Company

Commissioning (Company ...)

Submitted by Dept

All

Submitted by Function

All

EntrySource

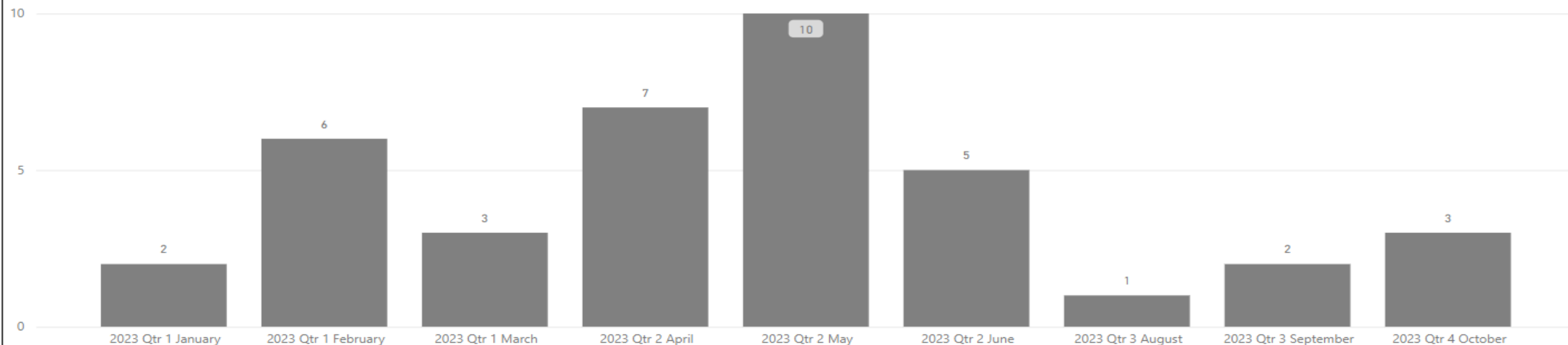
All

GC Month

All

Good Catch and Near Miss by Submission Date

Source ● External



Good Catch and Near Miss Details Table

| ID   | Submitted Date | Company | Type       | Title                | Event Description  | Potential Consequence  | Initial Corrective Action                              | Identified By |
|------|----------------|---------|------------|----------------------|--|--|--|---------------|
| 4018 | 4/6/2023       |         | Good Catch | Bus VT phasing error | While energizing the new 138kv build out a phasing error on the 138 bus VTs was caught as soon as X-116 was energized. | Primary phasing would have caught this mistake but not until the transformer was energized | Switching drops on A and C phases in old box structure |               |

Q&A





**Misoperations**

- a. 2023 Update, Review and Discussion

***John Grimm, Principal Systems Protection Engineer, MRO***

**Action**

Information

**Report**

John Grimm will provide an oral report during the meeting.

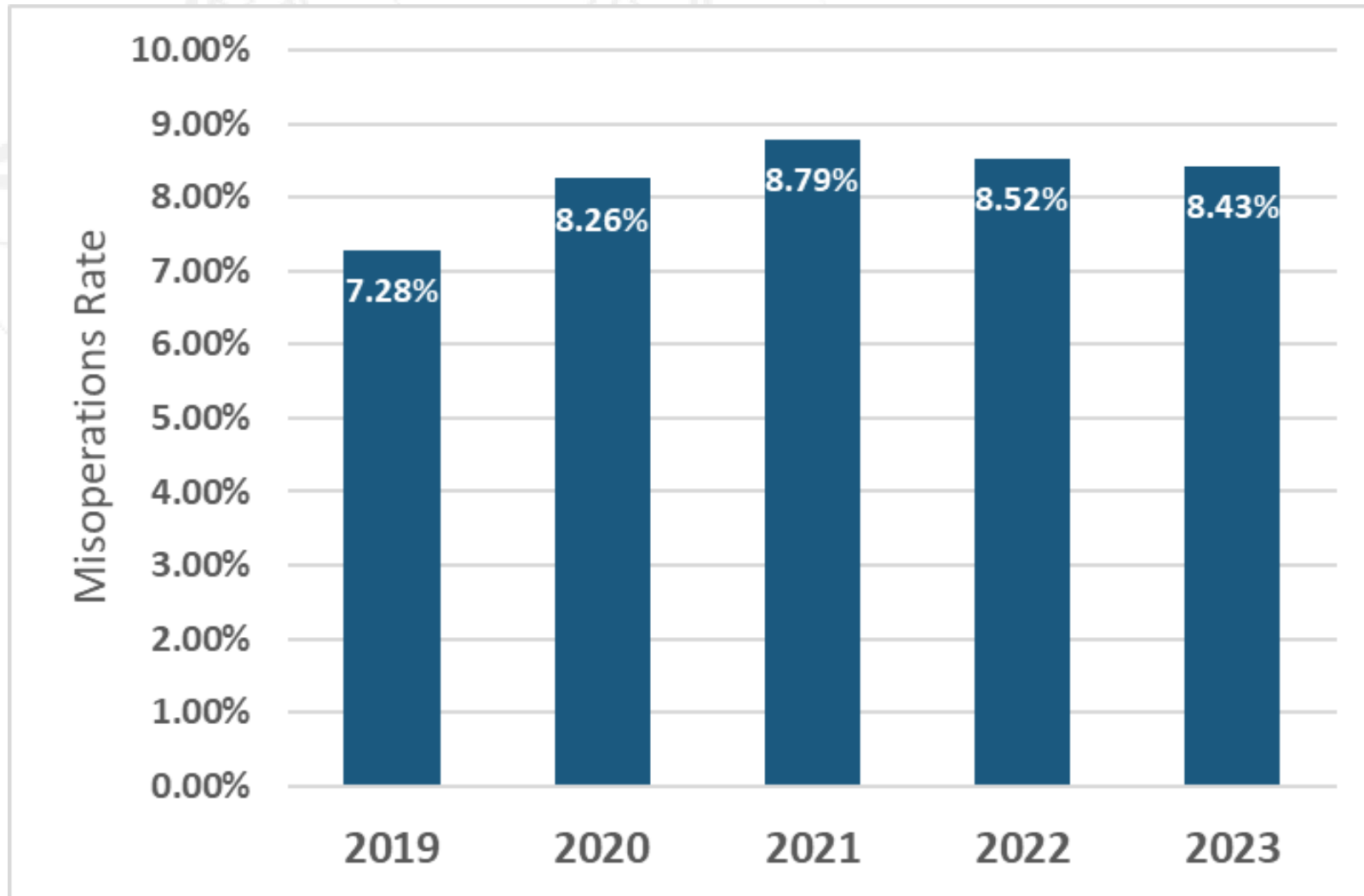


MIDWEST  
RELIABILITY  
ORGANIZATION

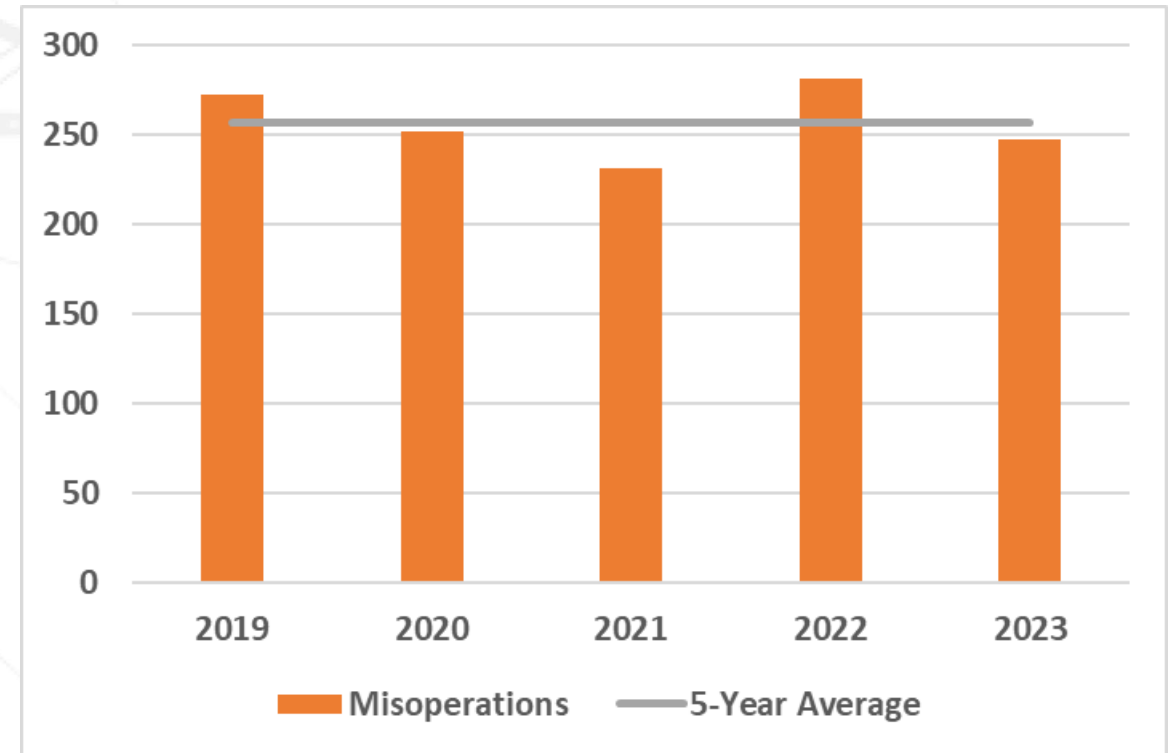
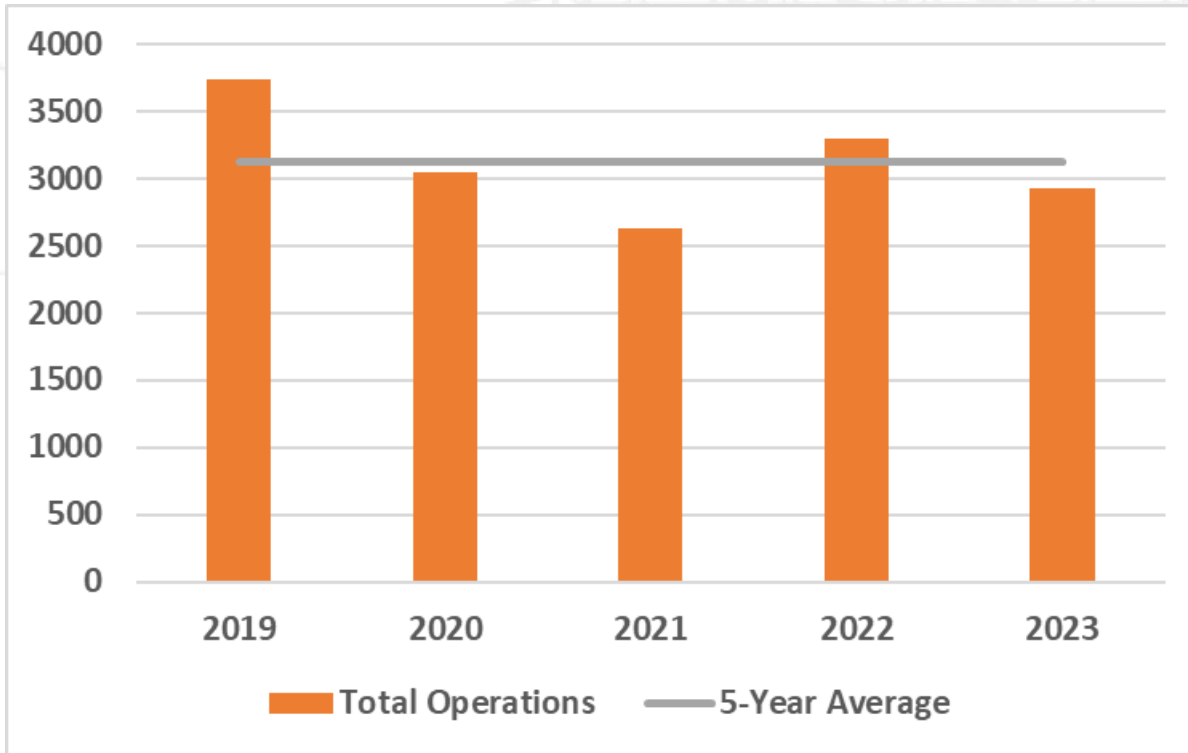
# **Q1 2024 PRS Misoperations Presentation**

**Jake Bernhagen, P.E.  
Manager, Reliability Performance  
Midwest Reliability Organization**

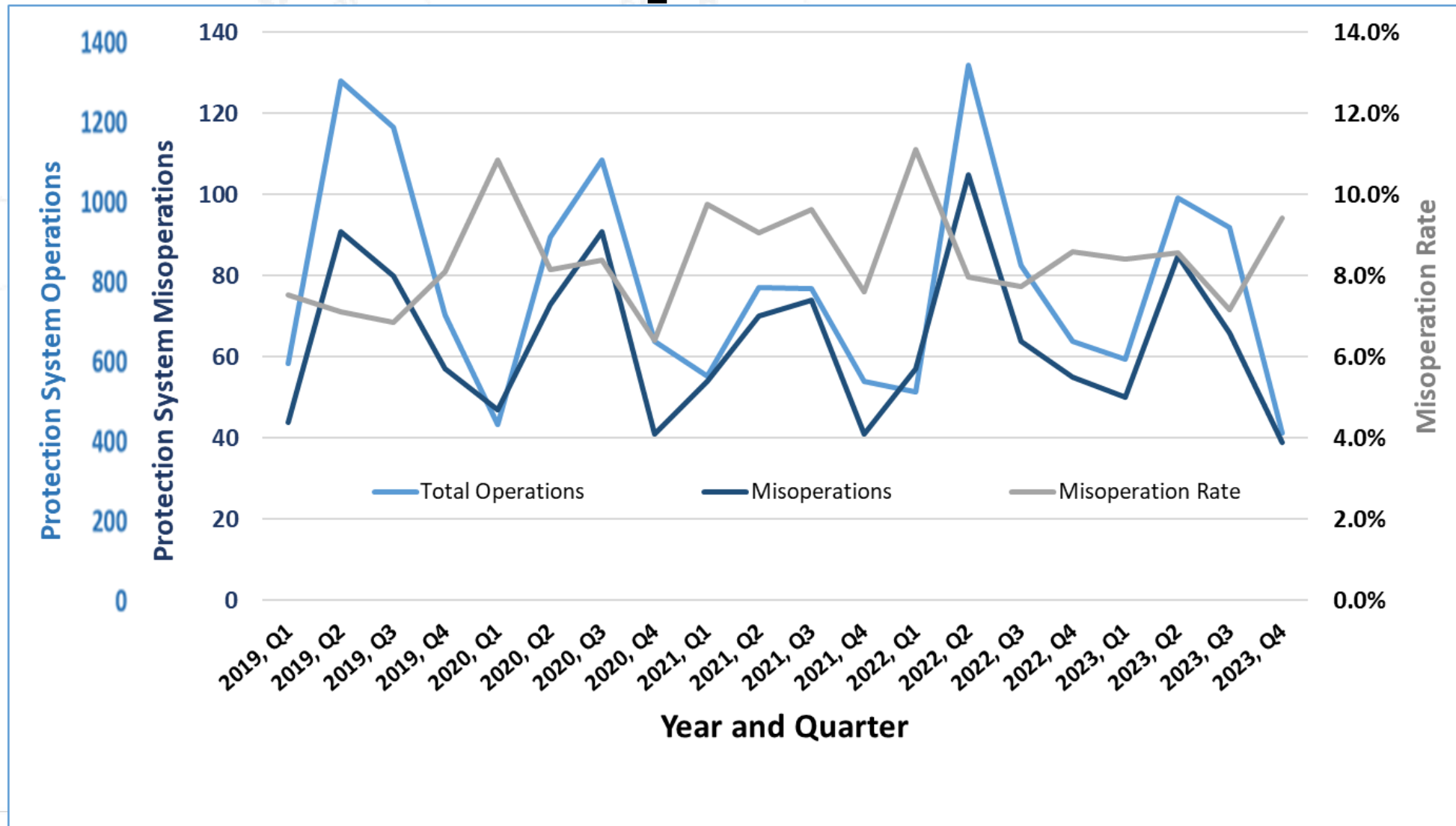
# MRO Misoperation Rate



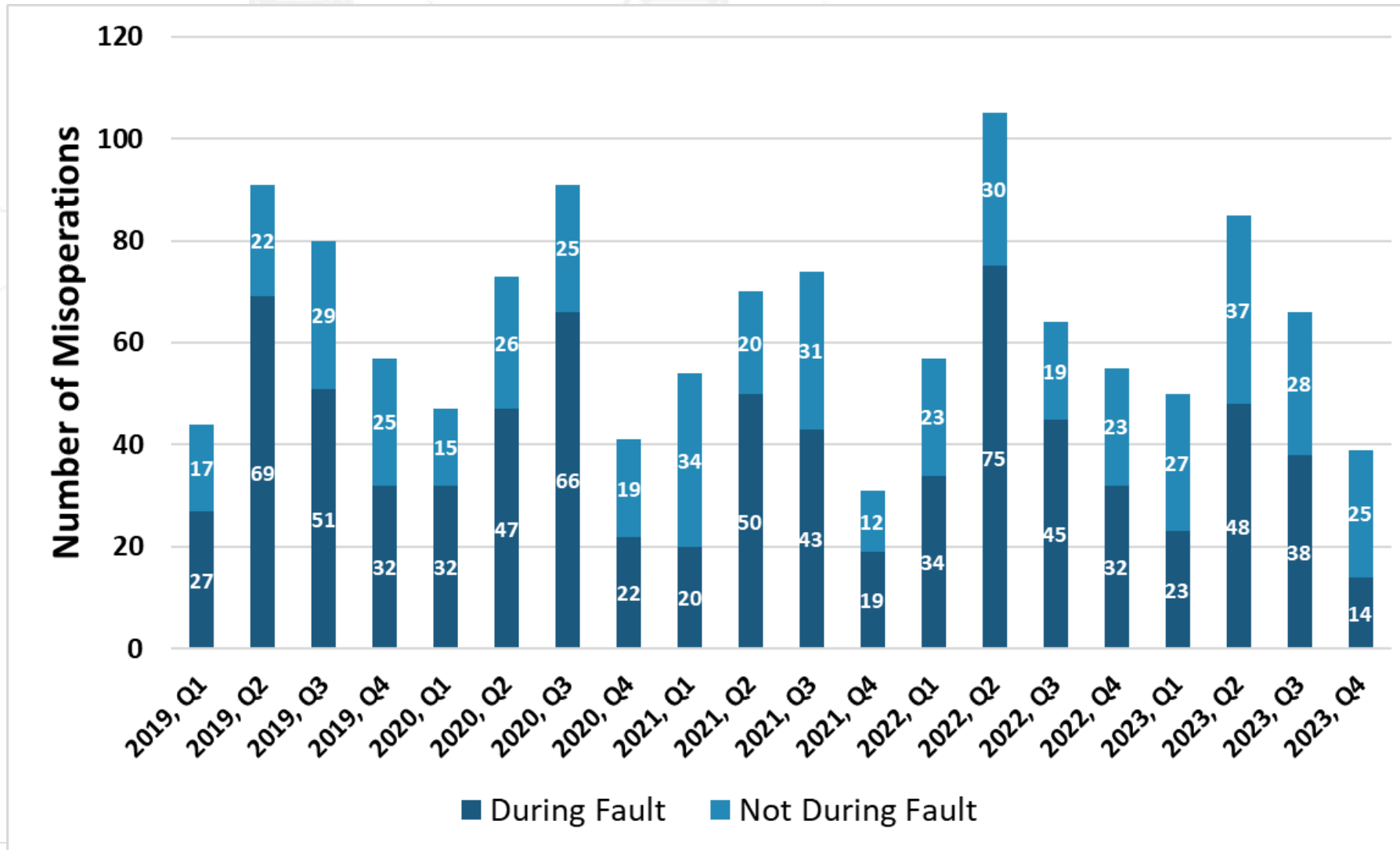
# MRO Ops & Misops Totals



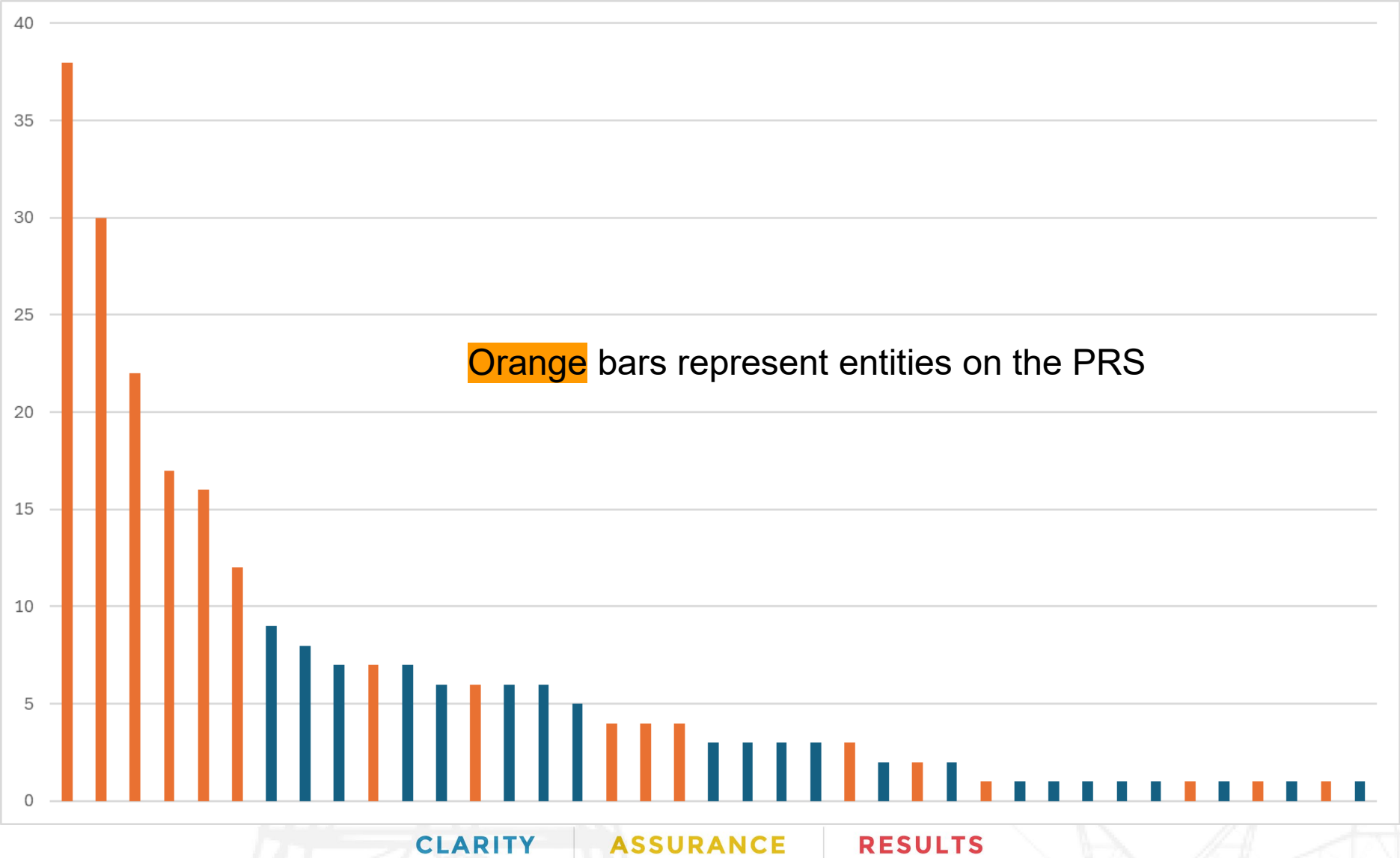
# MRO Misoperation Rate



# MRO Misoperation Rate

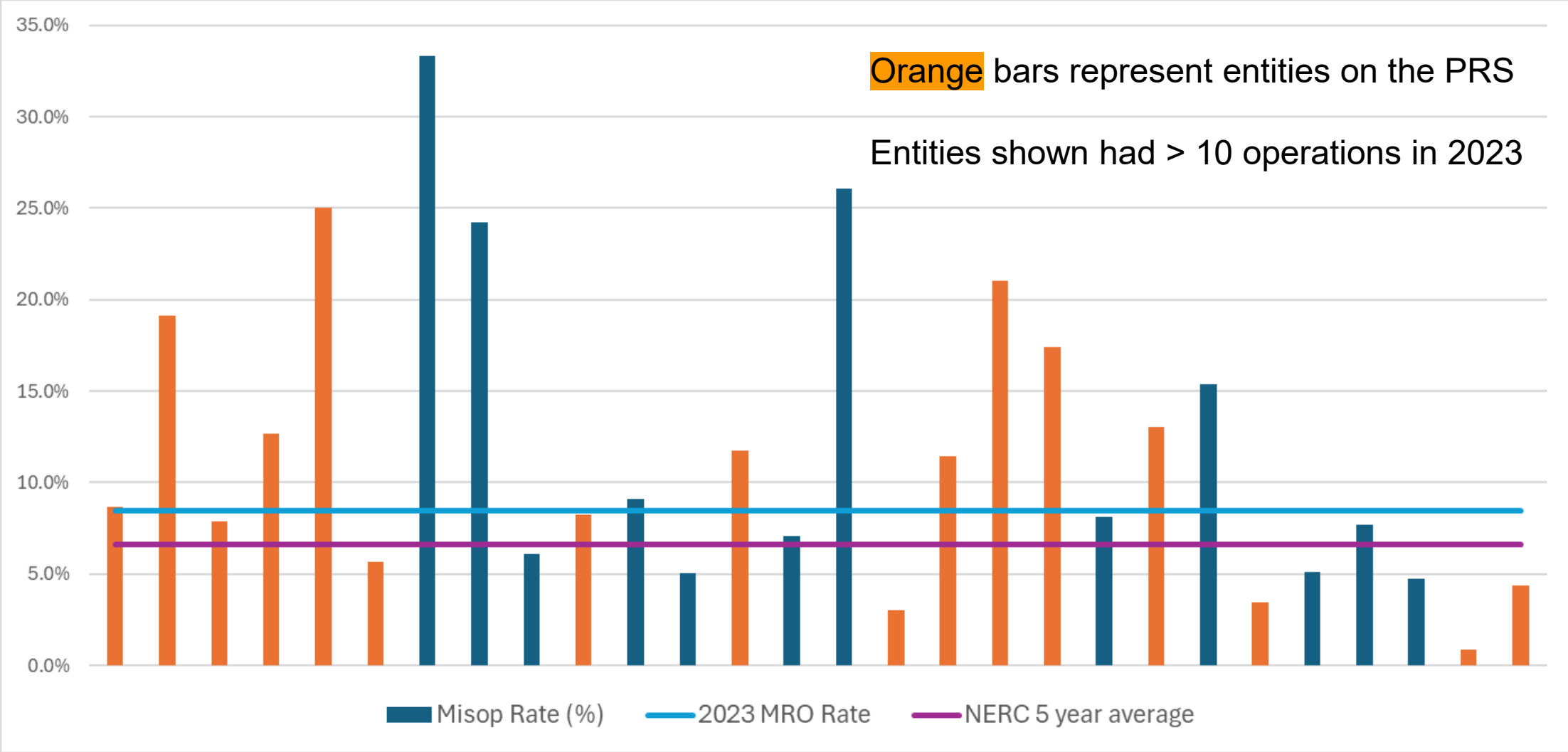


# MRO Entity 2023 Misoperation Totals

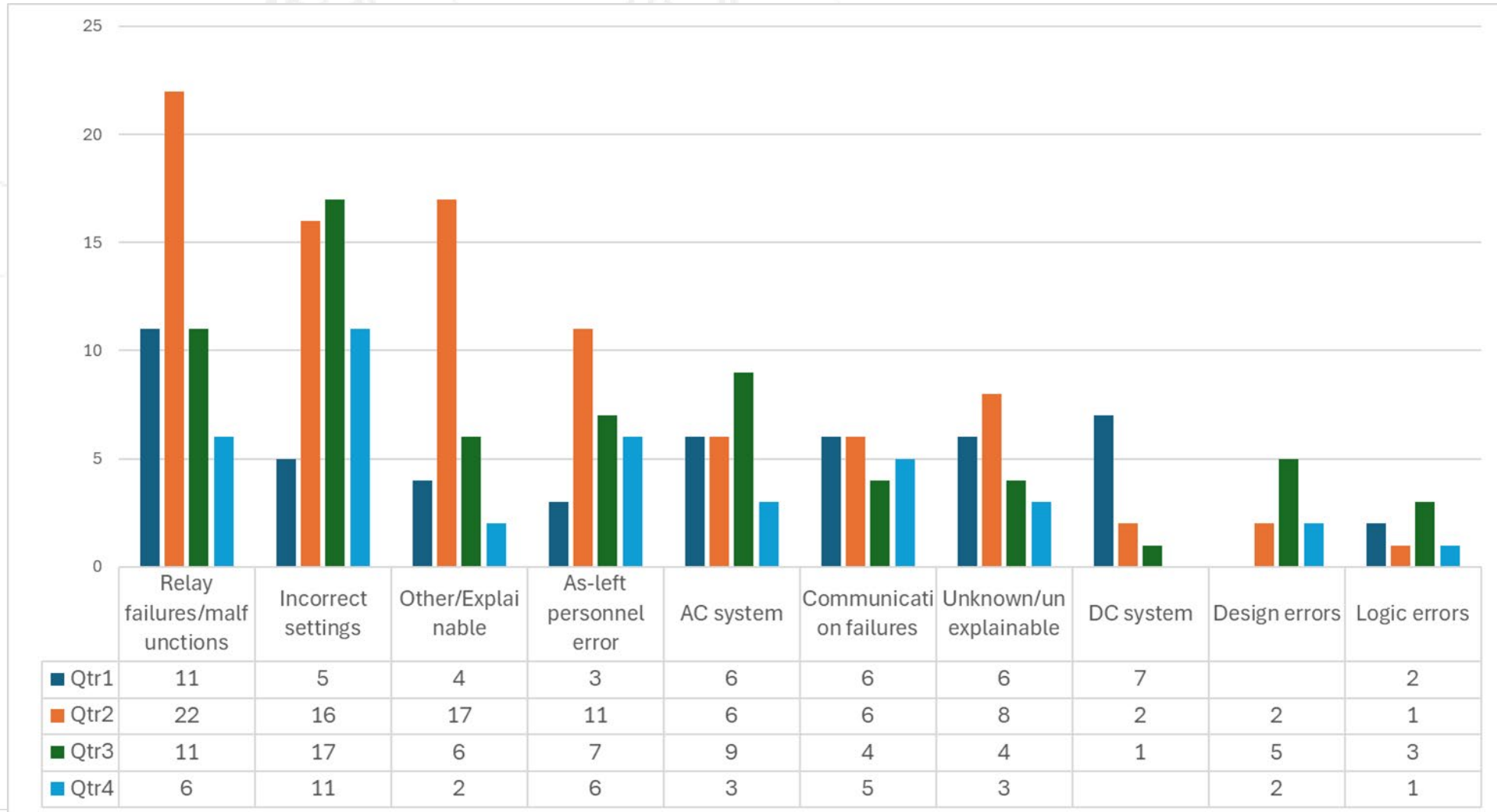




# MRO Entity 2023 Misoperation Rates



# 2023 Misoperations by Cause



# MRO Misoperations by Scheme



# Questions?



CLARITY

ASSURANCE

RESULTS

**Q4 2023 Misoperations Review**

a. Breakout Sessions

*John Grimm, Principal Systems Protection Engineer, MRO*

**Action**

Discussion

**Report**

John Grimm will lead this discussion during the meeting.

**PRS Roundtable Discussion**  
*Dennis Lu, Protective Relay Subgroup Chair*

**Action**

Discussion

**Report**

Chair Lu will lead this discussion during the meeting.

**Other Business and Adjourn**  
*Dennis Lu, Protective Relay Subgroup Chair*

**Action**

Discussion

**Report**

Chair Lu will lead this discussion during the meeting.