

## Agenda

# Member Representatives Committee

August 17, 2022 | 1:00 p.m. – 4:00 p.m. Pacific  
In-Person Meeting

### **In-Person**

Hyatt Regency Vancouver  
Regency C/D – 3<sup>rd</sup> Floor  
655 Burrard St.  
Vancouver, BC V6C 2R7, Canada

### **Virtual Attendees**

[Webcast Link for August 17, 2022 Meetings](#)

### **Introduction and Chair's Remarks**

### **NERC Antitrust Compliance Guidelines and Public Announcement\***

### **Consent Agenda**

1. **Minutes - (Approve)**
  - a. May 11, 2022 Meeting\*
  - b. July 20, 2022 Conference Call\*

### **Regular Agenda**

2. **Future Meetings\***
3. **Schedule for MRC Officer and Sector Elections\***
4. **General Updates and Reports**
  - a. Board of Trustees Nominating Committee Update\*
  - b. Business Plan and Budget Input Group Update\*
  - c. Regulatory Update\*
5. **Policy and Discussion Items**
  - a. Responses to the Board's Request for Policy Input\*
    - i. 2022-2023 Winter, 2023 Summer, and Long-Term Assessment and Preparations
  - b. Additional Policy Discussion of Key Items from Board Committee Meetings\*
    - i. Technology and Security Committee

- ii. Finance and Audit Committee Meeting
- c. MRC Input and Advice on Board Agenda Items and Accompanying Materials\*

**Technical Updates**

- 6. Identifying Emerging Issues for the 2022 Long-Term Reliability Assessment\***
- 7. Strategy for Strengthening Industry Action to Address Emerging Risks\***
- 8. Update on FERC Reliability Matters\***
- 9. Bulk Power System Situation Awareness Update\***

\*Background materials included.

# Antitrust Compliance Guidelines

## I. General

It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition.

It is the responsibility of every NERC participant and employee who may in any way affect NERC's compliance with the antitrust laws to carry out this commitment.

Antitrust laws are complex and subject to court interpretation that can vary over time and from one court to another. The purpose of these guidelines is to alert NERC participants and employees to potential antitrust problems and to set forth policies to be followed with respect to activities that may involve antitrust considerations. In some instances, the NERC policy contained in these guidelines is stricter than the applicable antitrust laws. Any NERC participant or employee who is uncertain about the legal ramifications of a particular course of conduct or who has doubts or concerns about whether NERC's antitrust compliance policy is implicated in any situation should consult NERC's General Counsel immediately.

## II. Prohibited Activities

Participants in NERC activities (including those of its committees and subgroups) should refrain from the following when acting in their capacity as participants in NERC activities (e.g., at NERC meetings, conference calls and in informal discussions):

- Discussions involving pricing information, especially margin (profit) and internal cost information and participants' expectations as to their future prices or internal costs.
- Discussions of a participant's marketing strategies.
- Discussions regarding how customers and geographical areas are to be divided among competitors.
- Discussions concerning the exclusion of competitors from markets.
- Discussions concerning boycotting or group refusals to deal with competitors, vendors or suppliers.
- Any other matters that do not clearly fall within these guidelines should be reviewed with NERC's General Counsel before being discussed.

### **III. Activities That Are Permitted**

From time to time decisions or actions of NERC (including those of its committees and subgroups) may have a negative impact on particular entities and thus in that sense adversely impact competition. Decisions and actions by NERC (including its committees and subgroups) should only be undertaken for the purpose of promoting and maintaining the reliability and adequacy of the bulk power system. If you do not have a legitimate purpose consistent with this objective for discussing a matter, please refrain from discussing the matter during NERC meetings and in other NERC-related communications.

You should also ensure that NERC procedures, including those set forth in NERC's Certificate of Incorporation, Bylaws, and Rules of Procedure are followed in conducting NERC business.

In addition, all discussions in NERC meetings and other NERC-related communications should be within the scope of the mandate for or assignment to the particular NERC committee or subgroup, as well as within the scope of the published agenda for the meeting.

No decisions should be made nor any actions taken in NERC activities for the purpose of giving an industry participant or group of participants a competitive advantage over other participants. In particular, decisions with respect to setting, revising, or assessing compliance with NERC reliability standards should not be influenced by anti-competitive motivations.

Subject to the foregoing restrictions, participants in NERC activities may discuss:

- Reliability matters relating to the bulk power system, including operation and planning matters such as establishing or revising reliability standards, special operating procedures, operating transfer capabilities, and plans for new facilities.
- Matters relating to the impact of reliability standards for the bulk power system on electricity markets, and the impact of electricity market operations on the reliability of the bulk power system.
- Proposed filings or other communications with state or federal regulatory authorities or other governmental entities.

Matters relating to the internal governance, management and operation of NERC, such as nominations for vacant committee positions, budgeting and assessments, and employment matters; and procedural matters such as planning and scheduling meetings.

## Draft Minutes

# Member Representatives Committee

May 11, 2022 | 1:00 p.m. – 4:00 p.m. Eastern

Chair Roy Jones, with Vice Chair Jennifer Flandermeyer present, called to order a duly noticed meeting of the Member Representatives Committee (MRC) of the North American Electric Reliability Corporation (NERC) via teleconference on May 11, 2022, at 1:00 p.m., Eastern, and a quorum was declared present. The agenda and MRC members and their proxies in attendance are attached as **Exhibits A and B**, respectively.

### Introduction and Chair's Remarks

Mr. Jones welcomed MRC members and attendees, acknowledging the NERC Board of Trustees (Board), David Ortiz and others from the Federal Energy Regulatory Commission (FERC), State Commissioner CJ Manthe, and CAMPUT representative David Morton.

### NERC Antitrust Compliance Guidelines and Public Announcement

Ms. Iwanek directed the participants' attention to the NERC Antitrust Compliance Guidelines included in the agenda package, and indicated that all questions regarding antitrust compliance or related matters should be directed to Sonia Mendonca, senior vice president, general counsel, and corporate secretary at NERC.

### Minutes

Upon motion duly made and seconded, the MRC approved the minutes of the February 10, 2022, and April 12, 2022, meetings as presented at the meeting.

### Future Meetings

The schedule of future meeting dates, including the pre-meeting and informational webinars for 2022, was included in the agenda package. Mr. DeFontes noted that the Board plans to hold the August meetings in-person in Vancouver, BC, Canada and is considering various format options.

### Board of Trustees Nominating Committee Update

Bob Clarke, chair of the Board of Trustees Nominating Committee (BOTNC), noted that three trustees have terms expiring in February 2023. Two trustees are eligible for re-election and one trustee is term limited. The BOTNC, with support from the MRC, endorsed the re-nomination of Jim Piro and Suzanne Keenan and will conduct a search to replace Roy Thilly. Nominations for the upcoming vacancy are due to the search firm by July 1, 2022, and the BOTNC will conduct interviews in November 2022 for final selection and recommendation to MRC.

### **Business Plan and Budget Input Group Update**

Jennifer Flandermeyer, chair of the Business Plan and Budget (BP&B) Input Group, provided an update on the group's activities since the last MRC meeting. The group met twice with NERC leadership to discuss NERC's proposed technology and people strategies, and the associated 2023, budget, 2024 and 2025 projections, and funding/assessment requirements. She expressed appreciation to the NERC team for their responsiveness to questions raised by the BP&B Input Group.

### **Regulatory Update**

Ms. Mendonca invited questions or comments regarding the regulatory report, which highlights Canadian affairs, as well as past and future significant FERC filings.

### **Responses to the Board's Request for Policy Input**

Mr. Jones acknowledged the MRC's responses to Mr. DeFontes' April 5, 2022, letter requesting policy input on strengthening industry action to address emerging risks, in addition to the preliminary agenda topics for the May meetings. Responses to the letter are [posted](#) on the NERC website.

### **Strengthening Industry Action to Address Emerging Risks**

John Moura, director of reliability assessment and performance analysis at NERC, noted that the industry is facing risks to reliability that are quickly emerging, such as the integration of large amounts of inverter-based resources, and requiring accelerated response. Mr. Moura discussed actions taken by the ERO related to inverter-based resources to disseminate information to industry, outline recommendations for improvement to the performance of inverter-based resources, and provide clear guidance for addressing root causes to many of the issues. The policy input letter requested MRC input on how the ERO Enterprise and industry can work together to address fast emerging risks and what other actions the ERO Enterprise should take related to the inverter-based resource challenges. Mr. Moura discussed the input received in response to the policy input letter. He stated that NERC would formulate an action plan to address inverter performance risk, elevate industry outreach, and engage the Reliability Issues Steering Committee (RISC) and Reliability and Security Technical Committee (RSTC) to support the efforts.

### **Additional Policy Discussion of Key Items from Board Committee Meetings**

Mr. Jones reminded attendees that full presentations were conducted at the Board committee meetings and would not be repeated during the MRC meeting. Attendees did not have any additional comments related to the Board's Finance and Audit, Technology and Security, and Corporate Governance and Human Resources Committee meetings.

### **MRC Input and Advice on Board Agenda Items and Accompanying Materials**

An MRC member expressed appreciation for the upcoming collaboration with NERC to develop recommendations around standards process improvement opportunities. Attendees did not have any other comments on the topics included on the Board's agenda for its meeting the next day.

### **Update on FERC Reliability Matters**

David Ortiz, acting director of the Office of Electric Reliability at FERC, provided an update on the following FERC reliability activities: joint federal-state task force on electric transmission; April 27-28, 2022, FERC, NERC, and Regional Entities Technical Conference on improving winter-readiness of

generating units; Notice of Proposed Rulemaking (NOPR) on internal network security monitoring for high and medium impact Bulk Electric System cyber systems; NOPR on transmission planning; Order directing ISO/RTO reports on potential reforms to meet changing system needs; and recent reliability orders.

### **Bulk Power System Situation Awareness**

Darrell Moore, director of bulk power system awareness (BPSA) and personnel certifications at NERC, provided an update on BPSA activities for the first quarter of 2022. He highlighted operating procedures implemented by Reliability Coordinators to help mitigate challenges from cooler temperatures. Mr. Moore provided an overview of mandatory OE-417 and EOP-004 reports for Q1, physical security reports for Q1, Energy Emergency Alert Level 3 (EEA3) reports from the past twelve months, and NERC Alerts published in Q1.

Mr. Moore also discussed an emerging issue regarding Mitsubishi electric transformers, where it was discovered that transformers rated 22kV, 2MVA, or above manufactured at Mitsubishi's Aki, Hyogo Prefecture plant did not fully comply with customer-requested testing standards. Mitsubishi is reaching out to impacted customers by May 13, 2022, and NERC, the North American Transmission Forum (NATF), and the Electric Power Research Institute (EPRI) are working together with Mitsubishi to understand more around extent of condition and the way forward.

### **Update and Next Steps on Energy Availability Standard Authorization Request**

Mike Knowland, manager of forecast and scheduling at ISO New England, and Mark Lauby, senior vice president and chief engineer at NERC, provided an update on the energy availability Standard Authorization Request (SAR) which was discussed in the January 5, 2022, policy input letter and at the February 2022 MRC meeting. Based on feedback received from the MRC, the RSTC, and a February 16, 2022, industry workshop, the Energy Reliability Assessment Task Force (ERATF) split the original SAR into two SARs—one for the planning time horizon and one for the operations/operational planning time horizon. A consideration of comments document is posted on the NERC website, outlining how comments from the MRC and RSTC were considered.

Mr. Knowland discussed next steps, including a May 19, 2022, industry webinar on the revised SARs and request for RSTC endorsement and Standards Committee (SC) acceptance of the SARs in June. Upon SC acceptance, the SARs will proceed through the standards development process.

Mr. Knowland and Mr. Lauby expressed appreciation for MRC input and support, and acknowledged that continued support will be important. Mr. Lauby also acknowledged the various industry partners that have been, and will continue to be, involved in this effort.

### **Coordination and Engagement with Organizations Across the Reliability Ecosystem**

Mr. Lauby discussed how the ERO Enterprise regularly leverages various organizations and industry expertise to address problems and avoid duplication of work. He discussed ERO Enterprise engagement with forums and industry associations, research and development organizations, policy makers, government, and regulators and provided examples of leveraged activities supporting the ERO's mission. He also discussed organizations that NERC engages for increased awareness of activities. Lastly, he noted

that one of the ways NERC and the Regional Entities work together is through collaboration groups. These collaboration groups meet regularly to ensure coordination and alignment where necessary, recognizing that each Regional Entity addresses reliability in unique ways based on its own challenges and stakeholder needs.

**Adjournment**

There being no further business, the meeting was adjourned.

Submitted by,



Kristin Iwanechko  
Secretary



# **DRAFT Minutes**

## **Member Representatives Committee Pre-Meeting Informational Session Conference Call and Webinar**

July 20, 2022 | 3:00 p.m. – 4:00 p.m. Eastern

### **Introduction and Chair's Remarks**

Chair Roy Jones convened a duly-noticed open meeting by conference call and webinar of the North American Electric Reliability Corporation (NERC) Member Representatives Committee (MRC) on July 20, 2022, at 3:00 p.m., Eastern. The meeting provided the MRC and other stakeholders an opportunity to preview proposed agenda topics for the MRC, Board of Trustees (Board), and Board Committee meetings scheduled to be held August 17-18, 2022, in Vancouver, BC, Canada. The meeting announcement and agenda are attached as **Exhibits A and B**, respectively.

### **NERC Antitrust Compliance Guidelines and Public Announcement**

Kristin Iwanechko, MRC Secretary, directed the participants' attention to the NERC Antitrust Compliance Guidelines included in the agenda package, and indicated that all questions regarding antitrust compliance or related matters should be directed to Sonia Mendonca, senior vice president, general counsel, and corporate secretary at NERC.

### **Schedule of Quarterly NERC Meetings and Conference Calls**

The draft schedule of events for the upcoming meetings was included in the agenda package.

### **Review of Proposed Board and Board Committees Meeting Agenda Items**

Shamai Elstein, associate general counsel at NERC, reviewed the preliminary agenda items for the Board and Board Committee meetings scheduled for August 17-18, 2022, that were identified in the slide presentation included in the informational session agenda package. MRC members should review all agenda materials for the Board and Board Committee meetings, once posted and available, and attend as many of these meetings as possible in advance of the MRC's meeting on August 17, 2022.

### **Review of Proposed MRC Agenda Items for August 17, 2022**

Mr. Jones reviewed the following preliminary MRC agenda items for the upcoming August 17, 2022, meeting that were identified in the slide presentation included in the informational session agenda package:

- Schedule for MRC Officer and Sector Elections;
- Board of Trustees Nominating Committee Update;
- Business Plan and Budget Input Group Update;
- Regulatory Update;

- Discussion of the Responses Submitted to the Policy Input Request from the Board;
  - Preparations for 2022-2023 Winter and 2023 Summer;
- Additional Discussion of the Items Presented at the Board Committee Meetings;
- MRC Input and Advice on Board Agenda Items and Accompanying Materials;
- Identifying Emerging Issues for the 2022 Long-Term Reliability Assessment;
- Plan to Strengthen Industry Action to Address Emerging Risks;
- Update on FERC Reliability Matters; and
- Bulk Power System Situation Awareness Update.

### **Policy Input Reminder**

Mr. Jones announced that the Board's request for policy input was issued on July 13, 2022, and responses are due by Wednesday, August 3, 2022, to Ms. Iwanechko. John Moura, director of reliability assessment and performance analysis at NERC, provided an overview of *2022-2023 Winter, 2023 Summer, and Long-Term Assessment and Preparations*, which was included in the Board's request for policy input.

The Board also requested input on the preliminary agenda topics presented during the MRC Informational Session. There will be time dedicated on the MRC's August 17, 2022, agenda for MRC members to provide input and advice on the Board agenda items after the final package has been posted.

### **Proxy Reminder**

Proxy notifications for the August 17, 2022, meeting must be submitted in writing to Ms. Iwanechko.

### **Meeting Adjourned**

There being no further business, the call was terminated.

Submitted by,



Kristin Iwanechko  
Secretary

## **Future Meetings**

### **Action**

Information

### **Summary**

The following are the future meeting dates for 2022 and 2023. The dates for 2022 pre-meeting and informational webinars are also included below.

### **2022 Dates**

October 12	Pre-Meeting and Informational Session
November 15-16	New Orleans, LA

### **2023 Dates**

February 15-16	San Diego, CA or South Florida
May 10-11	Washington, DC (Hybrid schedule)
August 15-17	Montreal or Ottawa
November 8-9	Atlanta, GA (Hybrid schedule)

## **Schedule for MRC Officer and Sector Elections**

### **Action**

Information

### **Background**

Chair Roy Jones will announce the upcoming nomination and election cycle for the Member Representatives Committee (MRC) officers and those members whose terms expire in February 2023. The tentative schedule is shown below.

### **MRC Officer Elections**

Monday, September 19 – nomination period opens

Tuesday, October 18 – nomination period closes

Wednesday, November 16 – election of officers for following year by current MRC members

### **MRC Member Sector Nominations and Elections**

Monday, September 19– nomination period opens

Thursday, November 17 – nomination period closes

Wednesday, December 14 – election begins

Friday, December 23 – election ends

### **Reference Links**

[Membership of the MRC for 2022-2024](#)

[NERC Bylaws](#)

## **Board of Trustees Nominating Committee Update**

### **Action**

Information

### **Summary**

The following MRC members are serving on this year's Board of Trustees Nominating Committee (BOTNC):

1. **Roy Jones** – MRC Chair
2. **Jennifer Flandermeyer** – MRC Vice Chair
3. **Joel Dembowski** – Investor-Owned Utility (Sector 1)
4. **John Twitty** – State/Municipal Utility (Sector 2)

Robert G. Clarke, chair of the BOTNC, will provide a status report on the planned activities and schedule for the BOTNC.

## **Business Plan and Budget Input Group Update**

### **Action**

Information

### **Summary**

The Business Plan and Budget (BP&B) Input Group was established as a means of getting MRC and stakeholder feedback toward each year's budget. The group meets at least once per month during the normal budget season and additionally in other months to receive updates on NERC's financial position and discuss upcoming budget strategies. The following MRC members are serving on this year's BP&B Input Group:

- **Jennifer Flandermeyer (Chair)** – MRC Vice Chair
- **Roy Jones** – MRC chair
- **Rachel Snead** – Investor-Owned Utility (Sector 1)
- **John Haarlow** – State/Municipal Utility (Sector 2)
- **Paul Choudhury** – Federal/Provincial Utility (Sector 4)
- **Brian Evans-Mongeon** – Transmission-Dependent Utility (Sector 5)
- **Lesley Gallinger** – ISO/RTO (Sector 10)

In addition to the above MRC members, the BP&B Input Group also includes NERC staff, the chair of the NERC Finance and Audit Committee (Jim Piro), and a representative from a Regional Entity (Tim Gallagher – RF).

Jennifer Flandermeyer, chair of the BP&B Input Group, will provide an update on behalf of the group at the August 17, 2022, MRC Meeting.

## **Update on Regulatory Matters (As of July 11, 2022)**

### **Action**

Information

### **FERC Orders Issued Since the Last Update**

FERC orders are available on the NERC website [FERC Orders/Rules](#) page.

### **NERC Filings to FERC Since the Last Update**

NERC filings to FERC are available on the NERC website [NERC Filings to FERC](#) page.

### **NERC Filings in Canadian Jurisdictions Since the Last Update**

NERC filings to Canadian applicable governmental authorities are available on the NERC website [Canadian Filings and Orders](#) page. This page also contains links to the websites of each of the Canadian applicable governmental authorities, where orders, consultation records, and other records related to NERC matters may be found.

Processes for making standards enforceable and monitoring and enforcing compliance are specific to each jurisdiction in Canada. The Federal, Provincial, and Territorial Monitoring and Enforcement Sub-group (MESG) has developed provincial summaries of each province's electric reliability standard-making and enforcement functions, with U.S. comparators. The [Canada](#) page of the NERC website contains these summaries, as well as a link to the [Canadian MOUs](#) page.

### **Anticipated NERC Filings**

Highlights of NERC filings that will be submitted to applicable governmental authorities in the U.S. and Canada appear below:

1. August 15, 2022 – Within 45 days of the end of each quarter, NERC must submit the unaudited report of the NERC budget-to-actual spending variances during the preceding quarter.  
*Docket No. FA11-21-000*  
*Pending Board approval*
2. August 17, 2022 – NERC will submit comments on the Notice of Proposed Rulemaking (“NOPR”) regarding Building for the Future Through Electric Regional Transmission Planning and Cost Allocation and Generator Interconnection.  
*Docket No. RM21-17-000*
3. August 26, 2022 – NERC will submit comments on the NOPR regarding Transmission System Planning Performance Requirements for Extreme Weather (proposing to direct revisions to TPL-001-5.1).  
*Docket No. RM22-10-000*

4. August 29, 2022 – NERC will submit comments on the NOPR directing One-Time Informational Reports on Extreme Weather Vulnerability Assessments.  
*Docket No. RM22-16-000*
5. August 29, 2022 – NERC will submit a quarterly filing in Nova Scotia of FERC-approved Reliability Standards.
6. September 15, 2022 – NERC will submit an update on the Project 2016-02 (Modifications to CIP Standards) schedule regarding development of standards language addressing virtualization.  
*Docket No. RD20-2-000*
7. September 28, 2022 – NERC will submit the annual Wide-Area Analysis of Technical Feasibility Exceptions report.  
*Docket Nos. RR10-1-000, RR13-3-000*



## **Responses to the Board's Request for Policy Input**

### **Action**

Discussion

### **Background**

The policy input letter is issued by the Chair of the NERC Board of Trustees (Board) four to five weeks in advance of the quarterly meetings and includes relevant materials necessary to inform and prepare for discussion. Written input from the Member Representatives Committee (MRC) and stakeholders is due three weeks after issuance and is then revisited during a dedicated discussion time on the MRC's agenda, in the presence of the Board.

### **Summary**

For this quarter, the Board requested specific policy input on 2022-2023 Winter, 2023 Summer, and long-term assessment and preparations. In addition, the Board requested input on preliminary Board, Board Committee, and MRC agenda topics. On August 17, 2022, the MRC can expect to participate in discussion on the responses received from the policy input request.

The policy input letter with its attachments and responses are posted with the Board's [August 2022 meeting materials](#).

## **Additional Policy Discussion of Key Items from Board Committee Meetings**

### **Action**

Discussion of specific items presented at the Board of Trustees (Board) Committee meetings. Staff presentations made at the Board Committee meetings will not be duplicated at the Member Representatives Committee (MRC) meeting.

### **Summary**

On August 17, 2022, the MRC will have additional time for policy discussion, as part of its own agenda, to respond to the information that is presented during the Board Committee meetings.

The Board committee agendas and associated background materials will be posted on the following webpages approximately one to two weeks in advance of the meetings:

[Technology and Security Committee](#)

[Finance and Audit Committee](#)

## **MRC Input and Advice on Board Agenda Items and Accompanying Materials**

### **Action**

Discussion

### **Background**

Article VIII, Section 1 of the [NERC Bylaws](#) states that the MRC shall have the right and obligation to “provide advice and recommendations to the Board with respect to the development of annual budgets, business plans and funding mechanisms, and other matters pertinent to the purpose and operations of the Corporation.”

In the policy input letter issued on July 13, 2022, the NERC Board of Trustees (Board) requested comments on the preliminary agenda topics for the August Board meeting that were reviewed during the July 20, 2022, MRC Informational Session. At the August 17, 2022, meeting, MRC members should come prepared to provide input on behalf of their sectors on the Board’s formal agenda package posted on August 4, 2022.

## Identifying Emerging Issues for the 2022 Long-Term Reliability Assessment

### Action

Update

### Background

The Long-Term Reliability Assessment (LTRA) is developed annually by NERC in accordance with the Electric Reliability Organization's (ERO) Rules of Procedure and Section 215 of the Federal Power Act, which instructs NERC to conduct periodic assessments of the North American bulk power system (BPS). The reliability assessment process is a coordinated reliability evaluation between the Reliability Assessment Subcommittee (RAS), the Regional Entities, and NERC staff. The scope of the LTRA includes the following:

- Review, assess, and report on the overall electric generation and transmission reliability (adequacy and operating reliability) of the interconnected BPS, both existing and as planned.
- Assess and report on the key issues, risks, and uncertainties that affect or have the potential to affect the reliability of existing and future electric supply and transmission.
- Review, analyze, and report on electric supply and bulk power transmission reliability, including reliability issues of specific Regional concern.
- Investigate, assess, and report on the potential impacts of new and evolving electricity market practices, new or proposed regulatory procedures, and new or proposed legislation (e.g. environmental requirements) on the adequacy and operating reliability of the BPS.

### Summary

The electricity industry provides NERC and the Regional Entities with resource adequacy projections for the 2023–2032 assessment period. In addition, the LTRA will include an in-depth probabilistic energy assessment which will evaluate hourly energy risks through 2027. Finally, the LTRA will identify key emerging issues facing the industry. These emerging issues are key inputs to the Reliability Issue Steering Committee's priorities report and Reliability and Security Technical Committee (RSTC) strategic plan.

At the August 17, 2022, MRC meeting, NERC staff will preview the emerging issues being considered for the 2022 LTRA. This is an opportunity to communicate preliminary topics, as well as gather any front-end input as ERO Staff and the RAS conduct their evaluations and produce the assessment.

2022 Long-Term Reliability Assessment Review Schedule	
Date	Description
September 26	Draft sent to RSTC
November 29	Embargoed report sent to NERC Board
December 14	NERC Board Conference Call to accept the report
December 15	Report release

## **Strategy for Strengthening Industry Action to Address Emerging Risks**

### **Action**

Update

### **Background**

Industry is facing risks to reliability that are quickly emerging and requiring accelerated response. For example, the integration of large amounts of inverter-based resources (IBR), which is accelerating across North America, must be done in a way that supports reliability—not degrade it or make it less certain. However, as we continue to observe, significant amounts of inverter-based resources cease or reduce energy production during system faults just when needed—this increasingly risky behavior impacts the reliable operation of the bulk power system (BPS).

According to the [2021 ERO Reliability Risk Priorities Report](#), Grid Transformation risks present the highest risk to reliability, particularly considering both likelihood and impacts that must be managed. The shift away from almost exclusively synchronous generation toward a new mix of large amounts of inverter-based resources and synchronous generation continues to challenge grid planners and operators.

The [2021 Long-Term Reliability Assessment](#) projects a rapid growth of IBRs on the BPS; these include mostly solar photovoltaic (PV) and wind, as well as new battery energy storage systems and hybrid power plants. Nameplate capacity projections of solar projects in all stages of development has breached 500 GW over the next 10 years. Wind projects are projected to total 360 GW of nameplate capacity over the next 10 years.

### **April 2022 Policy Input Response – Inverter Strategy**

As part of the April 5, 2022, Policy Input Letter, the NERC Board of Trustees requested input from the MRC on the following questions:

1. How can the ERO Enterprise and industry work together to address fast emerging risks to the reliable operation of the BPS with more effective and certain outcomes across North America?
2. Specifically for the inverter-based resource challenges, what other actions should the ERO Enterprise take to ensure known reliability gaps with BPS-connected inverter-based resource performance are addressed?

As a result of the comments and input received, NERC Staff has developed a draft strategy (attached) to ensure performance of inverter-based resources supports the reliable operation of the bulk power system. This draft strategy will be brought to the Reliability and Security Technical Committee (RSTC) at its September meeting for comment and enhancement.

### **Attachment**

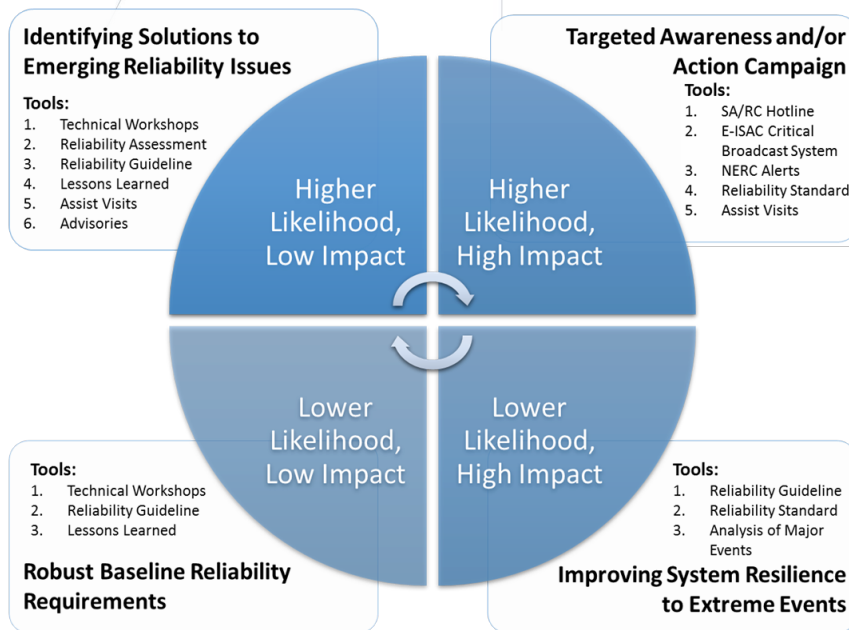
1. *Inverter-Based Resource Strategy: Ensuring Reliability of the Bulk Power System with Increased Levels of BPS-Connected IBRs*

## Inverter-Based Resource Strategy

Ensuring Reliability of the Bulk Power System with Increased Levels of BPS-Connected IBRs

### Purpose and Background

The rapid interconnection of bulk power system (BPS)-connected inverter-based resources (IBR)<sup>1</sup> is the most significant driver of grid transformation and poses a high risk to BPS reliability.<sup>2</sup> The speed of this change continues to challenge grid planners, operators, protection engineers, and many other facets of the electricity sector. Implemented correctly, inverter technology can provide significant benefits for the BPS; however, the new technology can introduce significant risks if not integrated properly. Based on recent analysis, these are high impact and high likelihood events that require substantive action by the ERO as called out by the NERC *Framework to Address Known and Emerging Reliability and Security Risks (NERC Risk Framework)*.<sup>3</sup> **Figure 1** shows reliability risk mitigation toolkit used by the ERO.



\*Likelihood is Likelihood of an "Adverse Reliability Impact"

**Figure 1: ERO Reliability Risk Mitigation Toolkit**

<sup>1</sup> This strategy focuses specifically on BPS-connected IBRs: wind, solar PV, battery energy storage systems, hybrid power plants, high voltage direct current networks, flexible ac transmission system devices, etc.

<sup>2</sup> 2021 ERO Reliability Risk Priorities Report:

[https://www.nerc.com/comm/RISC/Documents/RISC%20ERO%20Priorities%20Report\\_Final\\_RISC\\_Approved\\_July\\_8\\_2021\\_Board\\_Submitted\\_Copy.pdf](https://www.nerc.com/comm/RISC/Documents/RISC%20ERO%20Priorities%20Report_Final_RISC_Approved_July_8_2021_Board_Submitted_Copy.pdf)

<sup>3</sup> [https://www.nerc.com/comm/RISC/Related%20Files%20DL/Framework-Address%20Known-Emerging%20Reliability-Security%20Risks\\_ERRATTA\\_V1.pdf](https://www.nerc.com/comm/RISC/Related%20Files%20DL/Framework-Address%20Known-Emerging%20Reliability-Security%20Risks_ERRATTA_V1.pdf)

The *2021 NERC Long-Term Reliability Assessment*<sup>4</sup> projects a rapid growth of IBRs—mostly wind, solar photovoltaic (PV), battery energy storage systems, and hybrid plants—with projections of nameplate capacity for solar PV projects in all development stages exceeding 500 GW over the next 10 years. At the same time, wind projects are projected to total 360 GW of nameplate capacity. To maximize the amount of renewable resources, the inverter and plant controls and protection systems must support reliable operation of the BPS during system disturbances. Otherwise, these disturbances can become a limiting contingency, the correction of which may be to reduce the amount of renewable resource additions. This paper outlines NERC’s strategy to ensure that the transformation will lead to a more reliable, resilient, and secure BPS.

## **Risk Framework**

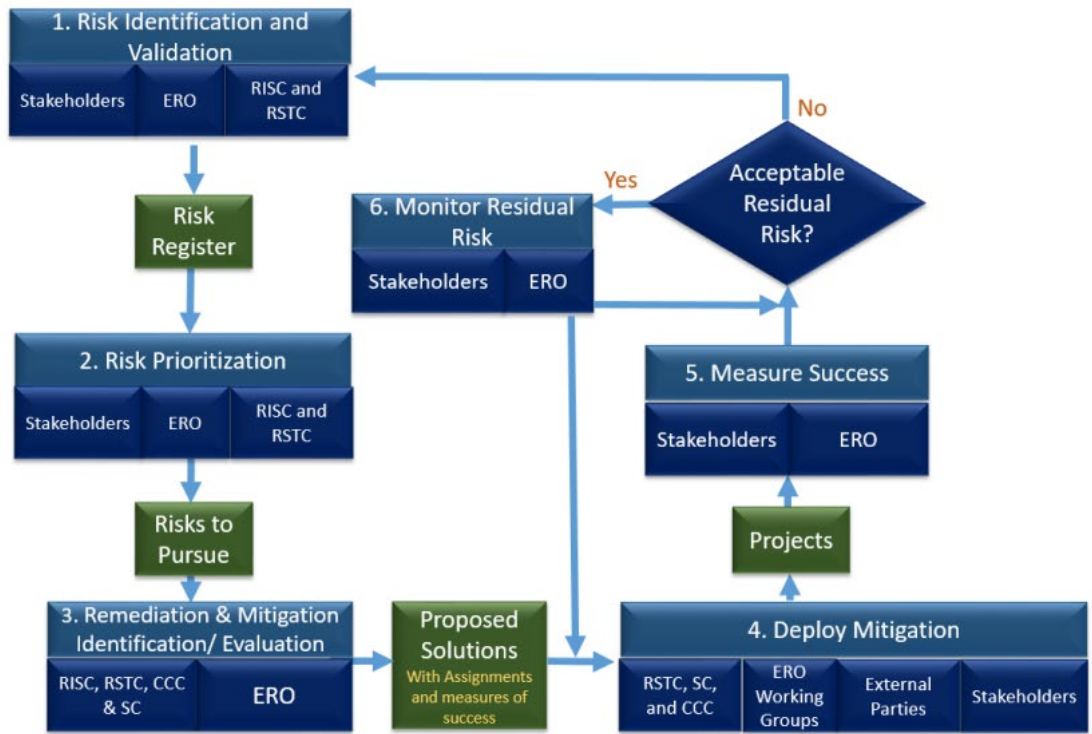
The *NERC Risk Framework* guides the ERO in the prioritization of risks and provides guidance on the application of ERO policies, procedures, and programs to inform resource allocation and project prioritization in the mitigation of those risks. Additionally, the *NERC Risk Framework* accommodates measuring residual risk after mitigation is in place, enabling the ERO to evaluate the success of its efforts in mitigating risk, which provides a necessary feedback for future prioritization, mitigation efforts, and program improvements. The successful reduction of risk is a collaborative process between the ERO Enterprise, industry, and the technical committees including the Reliability and Security Technical Committee (RSTC) and Reliability Issues Steering Committee (RISC). The *NERC Risk Framework* provides a transparent process using industry experts in parallel with ERO Enterprise experts throughout the process from risk identification, to deployment of mitigation strategies, and to monitoring the success of these mitigations. Six specific steps have been identified that are consistent with risk management frameworks used by other organizations and industries:

1. Risk Identification and Validation
2. Risk Prioritization
3. Remediation & Mitigation Identification/Evaluation
4. Deploy Mitigation
5. Measure Success
6. Monitor Residual Risk

Each of these steps will require process development, including stakeholder engagement, validation/triage approaches, residual risk monitoring, ERO Enterprise’s level of purview over a risk, etc. The graphical representation of the risk framework is shown in **Figure 2**.

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<sup>4</sup> [https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC\\_LTRA\\_2021.pdf](https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_LTRA_2021.pdf)



**Figure 2: Risk Framework**

**Risk Identification and Analysis through Event Analysis Process and Disturbance Reports**

The ERO Enterprise has analyzed numerous widespread IBR loss events and identified many systemic performance issues with the inverter-based fleet over the past six years. Through the Event Analysis Process and the development of disturbance reports<sup>5</sup> and alerts,<sup>6</sup> NERC has shared key findings and recommendations with industry stakeholders. This has involved working with NERC registered entities as well as directly with inverter and plant controller manufacturers, developers, national laboratories, the U.S. Department of Energy, research institutes, and international colleagues in an effort to enhance the performance of IBRs for existing and newly interconnecting projects. NERC continues to leverage the Event Analysis Process and work collaboratively with stakeholders to gather information, analyze large-scale disturbances, assess new risks, and monitor residual risks. This process is integral to the effective root cause analysis and dissemination of important information to industry.



<sup>5</sup> <https://www.nerc.com/pa/rrm/ea/Pages/Major-Event-Reports.aspx>

<sup>6</sup> <https://www.nerc.com/pa/rrm/bpsa/Pages/Alerts.aspx>

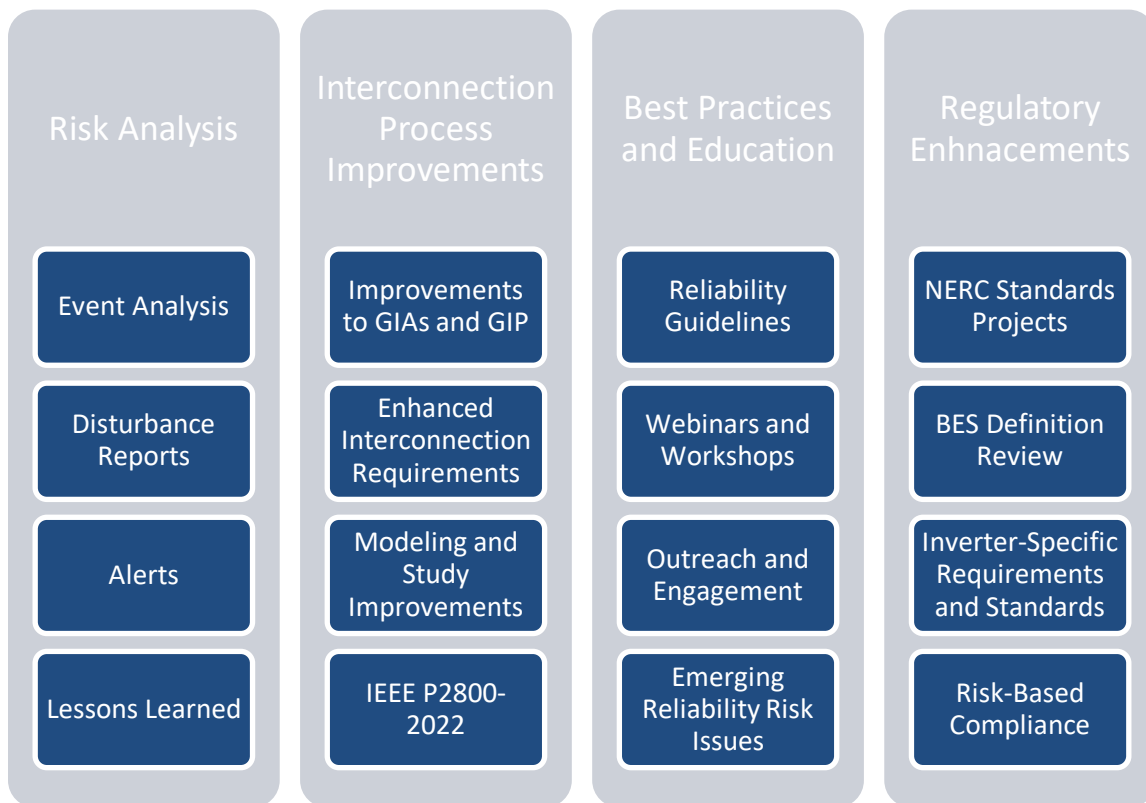


### Addressing Inverter-Based Resource Performance Issues

The disturbance reports, alerts, guidelines, and other deliverables developed by the ERO thus far have highlighted that abnormal IBR performance issues pose a significant risk to BPS reliability. Each event analyzed has identified new performance issues, such as momentary cessation, unwarranted inverter or plant-level tripping issues, controller interactions and instabilities, and other critical performance risks that must be mitigated.

### Core Tenets of the IBR Risk Mitigation Strategy

The ERO Enterprise is dedicated to proactively identifying and addressing IBR integration challenges and continues to work with industry stakeholders to drive risk mitigation activities. **Figure 3** provides the core tenets of this risk mitigation strategy, balancing near- and long-term approaches to ensure reliable operation of the BPS. The tenets of the IBR Mitigation Strategy can be mapped to the NERC Risk Framework.



**Figure 3: NERC IBR Risk Mitigation Strategy**

The following sections briefly describe each tenet of the risk mitigation strategy.

#### Mitigating IBR Performance Issues

A number of mitigation steps (see the **Risk Framework**) have been developed and deployed; however, consistent mitigation of the risks has been uneven. Generation ride-through and provision of essential



reliability services is a core principle for reliable operation of the BPS. NERC continues to drive improved resource performance through NERC guidelines,<sup>7</sup> disturbance reports, and standards modifications. Most recently, this has included a NERC Standard Authorization Request (SAR) to overhaul PRC-024 to ensure generator ride-through performance, numerous NERC standards projects underway, and considerations for inverter-specific performance standards (and requirements). NERC has supported the development of IEEE 2800-2022<sup>8</sup> and continues to support the IEEE P2800.2 standards development efforts.

Additional ERO Enterprise mitigating efforts include the following:

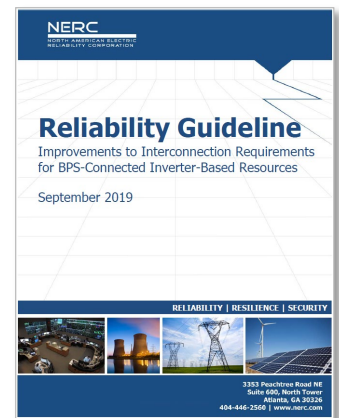
### 1. Supporting Modifications to the Generator Interconnection Procedures and Agreements

Many of the reliability risks associated with BPS-connected IBRs (e.g., model discrepancies, inaccurate reliability studies, poor ride-through performance) stem from challenges associated with the generator interconnection process. NERC recommended FERC overhaul and modernize the interconnection process to address these systemic issues. This includes significant revisions to the *pro forma* generator interconnection agreements and enhancements to the interconnection studies and commissioning process. FERC recently released a Notice of Proposed Rulemaking<sup>9</sup> regarding the interconnection process and the backlog of IBRs currently in the interconnection queues across North America. NERC continues to provide comments and technical basis for recommended modifications.



### 2. Driving Improvements to Interconnection Requirements for Inverter-Based Technologies

In 2019, NERC published *Reliability Guideline: Improvements to Interconnection Requirements for BPS-Connected Inverter-Based Resources*,<sup>10</sup> which strongly recommends significant enhancements to Transmission Owner interconnection requirements per NERC FAC-001 and modeling and study requirements per NERC FAC-002. This guideline has served as a pillar for IEEE 2800-2022 developments and NERC activities regarding effective IBR integration. However, NERC continues to observe and highlight that many applicable entities have not implemented the recommendations outlined in the guideline and continue to rely mostly on the *pro forma* GIAs with some modifications for specific topics (but not comprehensively).



<sup>7</sup> <https://www.nerc.com/comm/Pages/Reliability-and-Security-Guidelines.aspx>

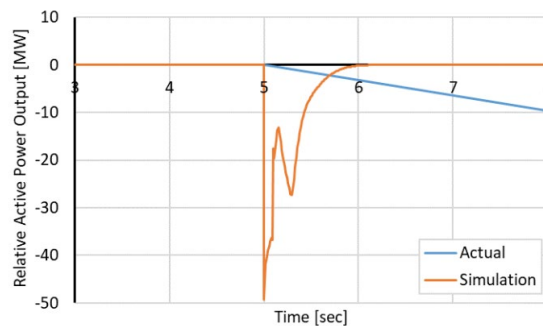
<sup>8</sup> <https://standards.ieee.org/ieee/2800/10453/>

<sup>9</sup> <https://www.ferc.gov/news-events/news/ferc-proposes-interconnection-reforms-address-queue-backlogs>

<sup>10</sup> [https://www.nerc.com/comm/RSTC\\_Reliability\\_Guidelines/Reliability\\_Guideline\\_IBR\\_Interconnection\\_Requirements\\_Improvements.pdf](https://www.nerc.com/comm/RSTC_Reliability_Guidelines/Reliability_Guideline_IBR_Interconnection_Requirements_Improvements.pdf)

### 3. Addressing Model Quality Issues and Inadequate Reliability Studies during the Interconnection Process and Long-term Planning Horizons

The aforementioned challenges regarding the interconnection process have led to significant modeling and study gaps when assessing BPS reliability for newly connecting IBRs. NERC continues to document systemic modeling errors in positive sequence dynamic models that are pervasive in the interconnection-wide planning cases. Disturbance analyses have also highlighted vast mismatches between modeled (expected) and actual performance. Modeling errors are due to changes made to equipment during the interconnection process and little to no updates to the models made along the way. Inadequate model quality checks throughout the process and a lack of modeling attention during plant commissioning are also contributors to these issues. As plants drop out of the queue, reliability studies must be re-executed, leading to delays in the process and gaps in sufficient studies being performance. Electromagnetic transient (EMT) models are not required to be collected and EMT studies are not required to be performed; however, as the penetration of IBRs grows, these studies will become increasingly necessary to ensure reliable operation of the BPS. The NERC *Odessa Disturbance* report<sup>11</sup> highlighted that essentially all EMT models collected by ERCOT had modeling limitations in them that resulted in those models being unable to recreate the abnormal performance across many different resources.



These issues stem from the interconnection study process but ultimately result in poor model quality issues in the interconnection-wide base cases that serve as the foundation for long-term planning studies. Model quality issues need to be addressed broadly across the industry to ensure that reliability studies are sufficiently accurate to make appropriate reliability decisions: corrective action plans, transmission reinforcements, operating limits, etc. NERC RSTC recently endorsed a SAR regarding model quality and EMT requirements for the FAC, MOD, and TPL standards; this SAR will be presented to the NERC Standards Committee in July 2022.

### 4. Focused Improvements to Commissioning Processes

A critical component of the interconnection process is the commissioning and trial operation period immediately prior to commercial operation. These activities ensure the plant has been modeled, studied, designed, constructed, and configured to match expectations and requirements of the local interconnecting utility (and per the interconnection procedures). Industry stakeholders from both generation and transmission have expressed concerns regarding the commission testing procedures, seeking clarity and consistency regarding what these processes entail. NERC IRPS is beginning the development of guidance materials in this area, and NERC is exploring the possible need for standards enhancements to ensure critical aspects of commissioning are conducted appropriately: model validation and quality checks, study result validation, plant configuration (operating modes, settings, controls, protections, etc.), and testing procedures.

<sup>11</sup> [https://www.nerc.com/pa/rrm/ea/Documents/Odessa\\_Disturbance\\_Report.pdf](https://www.nerc.com/pa/rrm/ea/Documents/Odessa_Disturbance_Report.pdf)

## **5. Post-Event Performance Validation and Addressing Abnormal Inverter Performance Issues**

Through the NERC Event Analysis Process, NERC has identified that very few inverter-based Generator Owners are conducting performance validation activities (i.e., ensuring the facility responds to grid disturbances with a suitable and expected performance). Furthermore, NERC has also identified that Reliability Coordinators and Balancing Authorities are either not conducting this analysis and/or may not have suitable mechanisms to seek corrective actions if discrepancies are identified. Proactive mitigation of performance issues is critical to avoid large-scale outages and to address systemic performance issues. These issues need to be addressed through appropriate NERC standards enhancements in the near-term.

## **6. Analysis and Enhanced IBR Performance Issues**

The NERC Inverter-Based Resource Performance Subcommittee (IRPS) is drafting a SAR focused on analysis and reporting of IBR performance issues. A SAR focused on mirroring PRC-004 in terms of defining the type of inverter-specific performance issues that are similar to a “misoperation” that should have analysis conducted by the Generation Owner or Generation Operator and reported to the Reliability Coordinators, Balancing Authorities, and Transmission Operator.

## **7. Other Topics Identified Through Stakeholder Activities and Lessons Learned**

NERC and the IRPS continue to identify additional areas for improvement and are driving NERC standards enhancements in various areas. This includes improved monitoring capabilities for IBRs,<sup>12</sup> addressing confusion with “material modifications” during the interconnection study process,<sup>13</sup> clarifications in the long-term planning studies for IBRs,<sup>14</sup> and other topics. NERC is working with industry stakeholders through the IRPS to proactively identify challenges with existing standards or the potential standards enhancements to address the changing resource mix.

## **8. Industry Engagement, Outreach, Education, and Collaboration**

NERC is committed to ensuring that industry stakeholders are aware of efforts underway in the area of IBR integration. All NERC activities directly related to the “IBR initiative” are now located under the Initiatives tab on the main NERC webpage.<sup>15</sup> Reliability guidelines related to IBRs are the most commonly downloaded documents on the NERC website. Disturbance report webinars and related joint industry webinars on inverter-related topics are heavily advertised and often have over 1,000 participants dialing in. NERC IRPS meetings often have over 150 dial-in participants each month. NERC is leveraging industry partnerships with other organizations, such as the Electric Power Research Institute, the North American Transmission Forum, the North American Generation Forum, the Energy Systems Integration Group, the IEEE 2800 leadership team, and many others to ensure coordinated efforts across the industry on many of the topics described in this strategy.

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<sup>12</sup> <https://www.nerc.com/pa/Stand/Pages/Project-2021-04-Modifications-to-PRC-002-2.aspx>

<sup>13</sup> <https://www.nerc.com/pa/Stand/Pages/Project-2020-05-Modifications-to-FAC-001-and-FAC-002.aspx>

<sup>14</sup> <https://www.nerc.com/pa/Stand/Pages/Project2022-02ModificationstoTPL-001-5-1andMOD-032-1.aspx>

<sup>15</sup> [https://www.nerc.com/pa/Documents/IBR\\_Quick%20Reference%20Guide.pdf](https://www.nerc.com/pa/Documents/IBR_Quick%20Reference%20Guide.pdf)

## **Monitoring Success of Mitigation Activities**

Per the *NERC Risk Framework*, an important aspect of mitigation is measuring the effectiveness of mitigation activities. A portion is accomplished through ERO Enterprise event and disturbance analysis contributions. However, a more consistent/ensured notification approach is needed as data critically necessary to understanding an IBR-involved event can be omitted and/or overlooked due to lethargy in notification and/or misunderstanding of notification expectations. For this reason, the IRPS is working on an EOP-004 SAR, requiring ERO notification by Balancing Authorities and/or Reliability Coordinators of widespread inverter-related performance issues across the grid. This will ensure IBR-involved events of interest (based on notification criteria) are captured immediately resulting in improved quality and timeliness of analysis. This will enable the ERO to swiftly obtain event data, identify the causes of IBR loss, and measure the success of industry actions to mitigate the risks from poor performing IBRs.

## **Additional Activities**

Additional activities will support the strategy now and into the future. Some of these are as follows:

### **1. Risk-Based Compliance Activities**

The ERO Enterprise risk-based Compliance Monitoring and Enforcement Program (CMEP) focuses on identifying, prioritizing, and addressing risks to the BPS and enables each Regional Entity to direct resources where most needed. CMEP activities are tailored based on BPS risk of registered entities, collectively and individually, to determine appropriate CMEP tools to use when monitoring an entity's compliance with NERC Reliability Standards. Reliable integration of BPS-connected IBRs is a high-risk topic across multiple Regional Entities, and the ERO Enterprise CMEP activities reflect this concern. Reliability Standards to consider in these activities include FAC-002, MOD-033, and IRO-008.<sup>16</sup>

### **2. NERC Alert Level 3**

As the risks of abnormal IBR performance and challenges with modeling and studies are systemic in nature and are moving quickly, NERC is considering issuing a Level 3 alert in this area. This would enable industry action while Reliability Standards are being developed. Working with industry, NERC should develop an agreed upon process to develop and deploy Level 3 alerts.

### **3. BES Definition and Registration**

The Bulk Electric System (BES) encompasses all elements and facilities necessary for reliable operation and planning of the BPS. A revised version of the BES definition was approved by FERC in 2014 that includes bright-line criteria with various inclusions and exclusions. The current BES definition generally includes individual generating units larger than 20 MVA and aggregate resources larger than 75 MVA that are connected to the BPS at a nominal voltage of 100 kV or above. The vast majority of newly connecting generators are dispersed power producing resources that do not have individual generating units larger than 20 MVA; hence, only the aggregate 75 MVA threshold would be applicable. However, a significant portion of the generation base does not meet this 75 MVA threshold and therefore does not meet the BES definition and are therefore not subject to any NERC

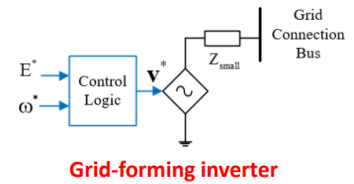
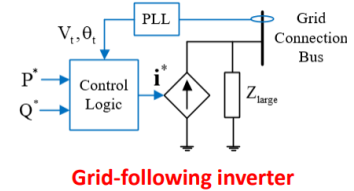
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<sup>16</sup> <https://www.nerc.com/pa/Stand/Reliability%20Standards%20Complete%20Set/RSCompleteSet.pdf>

Reliability Standards. NERC is analyzing the breakdown of resource size, location, type, and applicability with the BES definition to make a determination of whether the current BES threshold should be updated to reflect the changing resource mix.

#### 4. Proactively Preparing for Future Reliability Challenges with Growing IBRs

The BPS is undergoing a rapid transition and will need to adopt new technologies to ensure reliability in the future. Proactively integrating these new technologies may be drastically more cost effective than the possible reliability risks posed if no action is taken. For example, in very high IBR penetration levels, grid-forming technology may be necessary (in conjunction with synchronous condensers and other technologies). The incremental cost of adding grid-forming controls to battery energy storage systems is very low; however, newly interconnecting projects are not being installed with this technology enabled. NERC is working with industry stakeholders to identify future BPS reliability risks and develop strategies for more proactive solutions to mitigate future risks rather than waiting until those risks manifest.



### Milestone Plan

The following deliverables are planned to be presented to the NERC Reliability and Security Technical Committee:

- **Disturbance Report Follow-Up Analysis:** Ongoing assessments after NERC disturbance reports are published reviewing key findings and recommendations and determining if any additional IRPS actions are needed. *(Ongoing)*
- **SAR – EOP-004:** SAR to ensure that reporting of widespread inverter-based disturbances are reported to the ERO Enterprise in a timely manner to enhance the analysis of these types of events. *(Q3 2022)*
- **SAR – PRC-004:** SAR to ensure that facility owners with resources operating (based on protection or controls) in an unreliable and unexpected manner identify these events, analyze them, and determine if corrective actions are necessary. *(Q3 2022)*
- **Reliability Guideline – EMT Modeling and Studies:** Industry guidance to prepare for the growing need for EMT studies to fully understand any possible reliability risks of IBRs. *(Q4 2022)*
- **Reliability Guideline – Recommended Approaches to Interconnection Studies for BPS-Connected IBRs:** Industry guidance on considerations during the interconnection study process to help expedite the processing and studies of newly interconnecting IBRs with sufficient due diligence. *(Q4 2022)*
- **SAR – Revisions to FAC-001 and FAC-002:** SAR to ensure that the standards provide sufficient strength such that any performance issues identified by Transmission Operators, Reliability Coordinators, or Balancing Authorities that do not meeting the established interconnection requirements are addressed with corrective actions. *(Q1 2023)*

- **White Paper – Grid Forming Roadmap:** Input and guidance around future grid reliability needs with increasing levels of IBRs and draft specifications for the possibility of needing grid forming technology. *(Q1 2023)*
- **White Paper – Gap Analysis of Any IBR Related Issues Not Addressed by Existing NERC Standards:** Comprehensive gap analysis of all known IBR issues, industry actions in these areas, and possible IRPS actions to address any existing gaps, including the need for more guidance or any possible future NERC standards revisions. *(Q1 2023)*
- **White Paper – BPS-Connected IBR Commissioning Best Practices:** Guidance and recommended practices related to commissioning IBRs, focused on ensuring plant operating modes, settings, controls, and protection are set appropriately and that models and studies were conducted accurately to match installed equipment. *(Q2 2023)*

## **Update on FERC Reliability Matters**

### **Action**

Update

### **Summary**

At the August 17, 2022, MRC meeting, Kal Ayoub, Deputy Director, Division of Cyber Security, Office of Electric Reliability, will provide an update on recent FERC activity.



## **Bulk Power System Situation Awareness Update**

### **Action**

Information

### **Background**

NERC's Bulk Power System Awareness (BPSA) group acquires and disseminates timely, accurate and complete information regarding the current status of the bulk power system (BPS) and threats to its reliable operation, to enable the ERO Enterprise to effectively assure the reliability of the BPS. During major system disturbances, extreme weather, fires, hurricanes, physical events, and geomagnetic disturbances, etc. the BPSA group facilitates effective communications among the ERO Enterprise, industry and government stakeholders.

NERC BPSA, in collaboration with the E-ISAC and the ERO Enterprise Situation Awareness teams, is responsible for the following:

- Maintaining a near real-time situation awareness of conditions on the BPS;
- Notifying industry of significant BPS events that have occurred in one area, and which have the potential to impact reliability in other areas; and
- Maintaining and strengthening high-level communications, coordination, and cooperation with government agencies regarding real-time conditions.

Attached is an overview of BPS activities for the second quarter of 2022. There will not be a formal presentation at the August 17, 2022, MRC meeting.

### **Attachments**

1. Bulk Power System Awareness: Situational Awareness 2022 (Second Quarter Overview)

# NERC

NORTH AMERICAN ELECTRIC  
RELIABILITY CORPORATION

# Bulk Power System Awareness

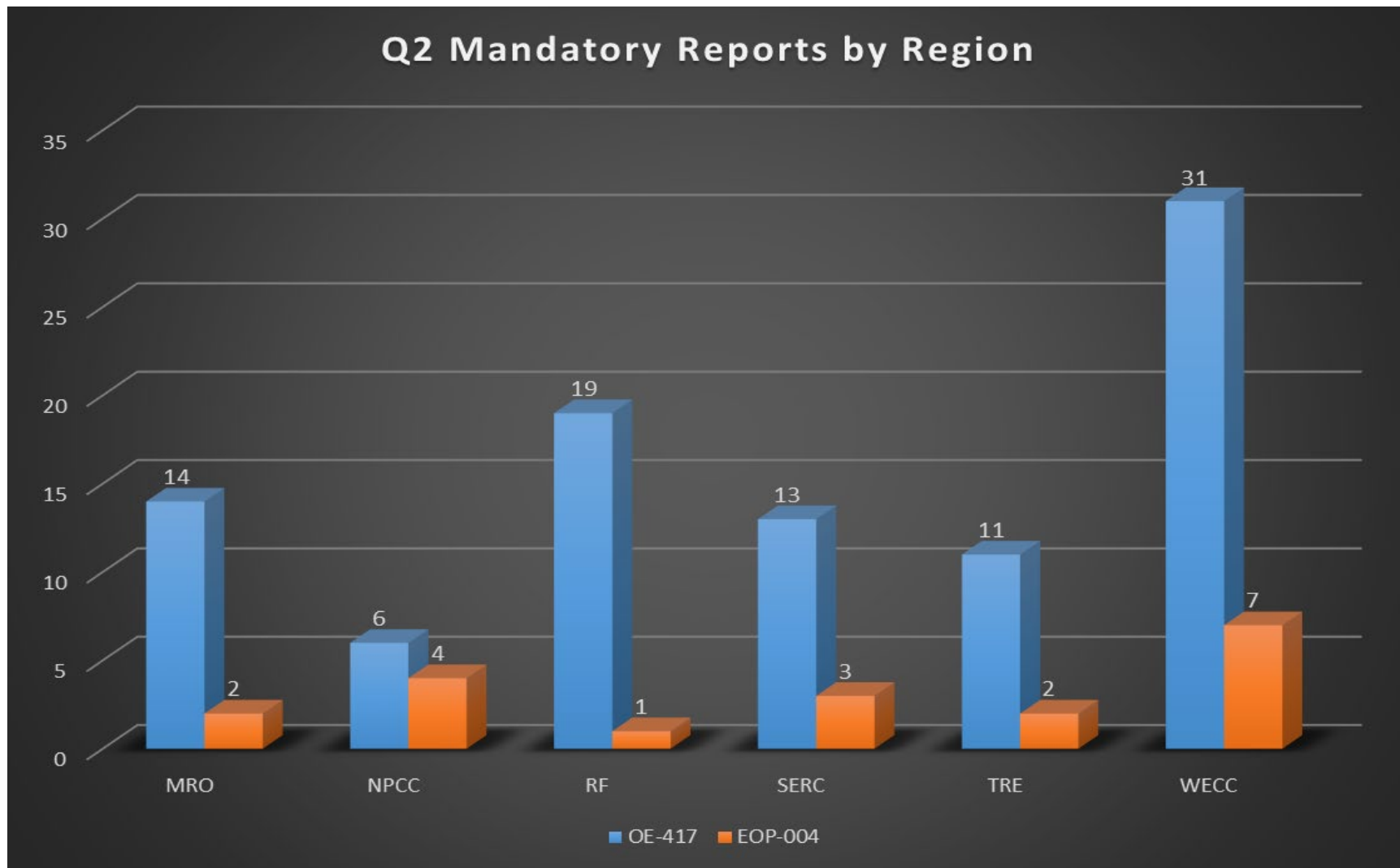
## Situational Awareness 2022

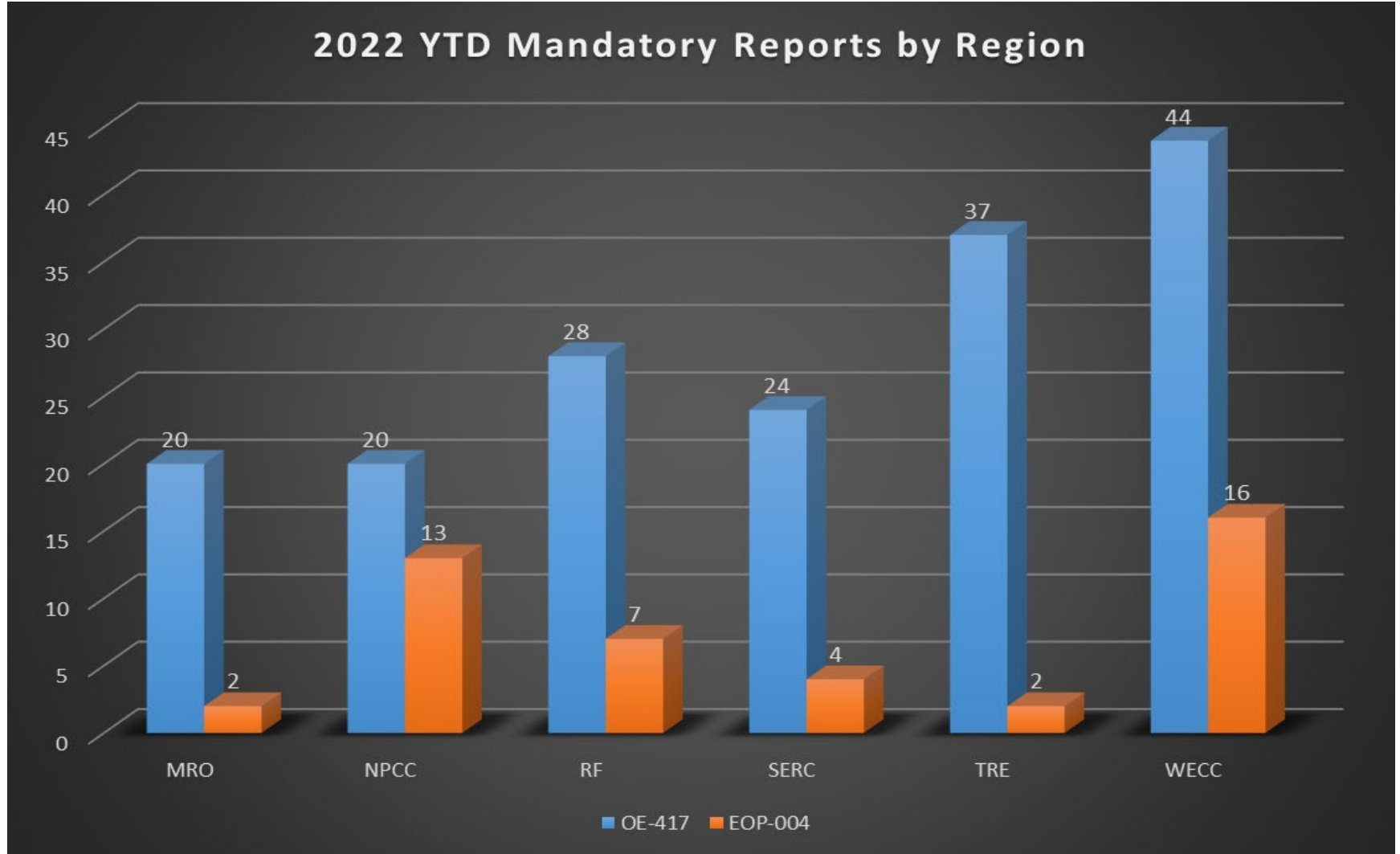
Darrell Moore, Director  
Bulk Power System Awareness and Personnel Certification  
Member Representatives Committee Meeting  
August 17, 2022

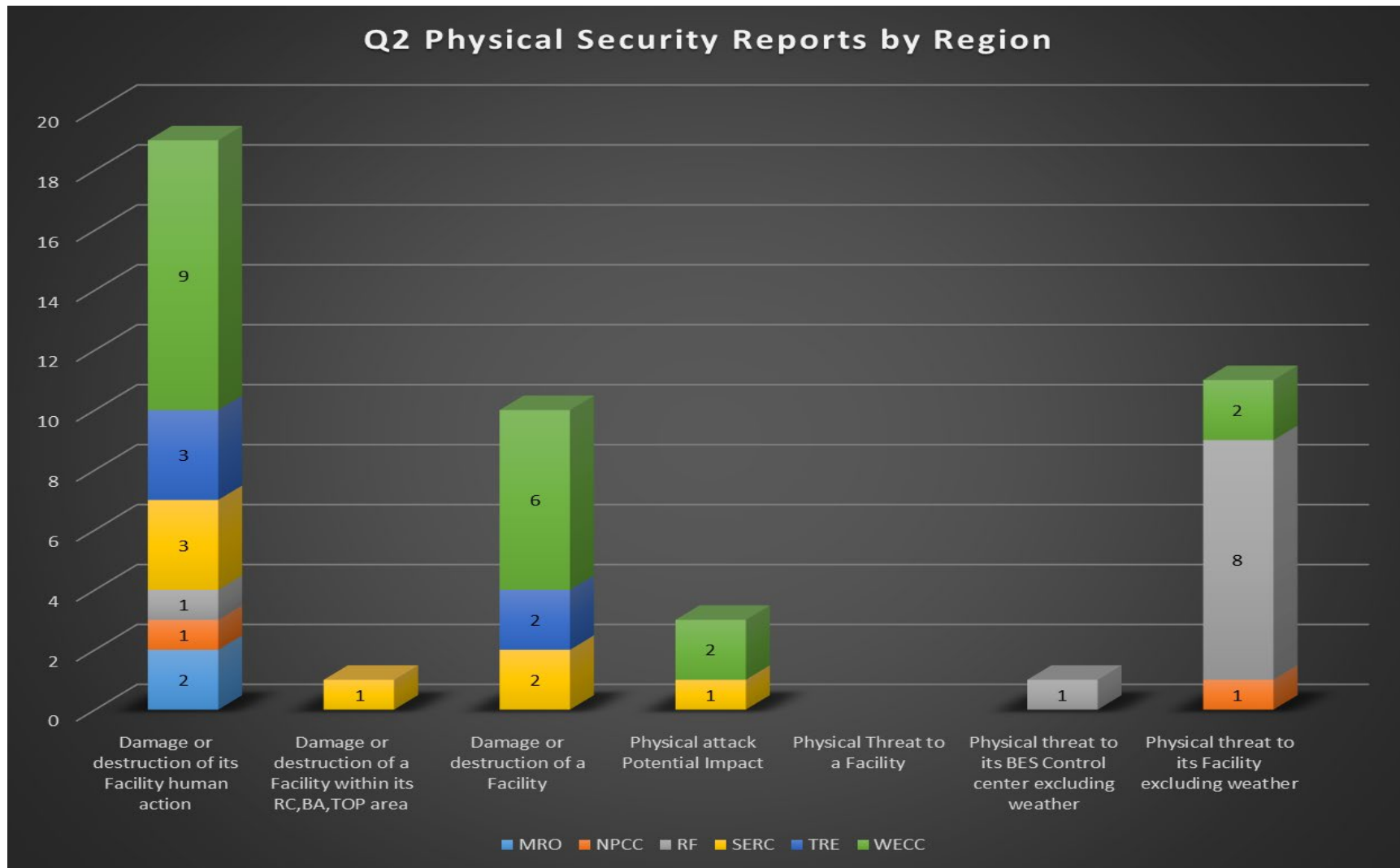
**RELIABILITY | RESILIENCE | SECURITY**

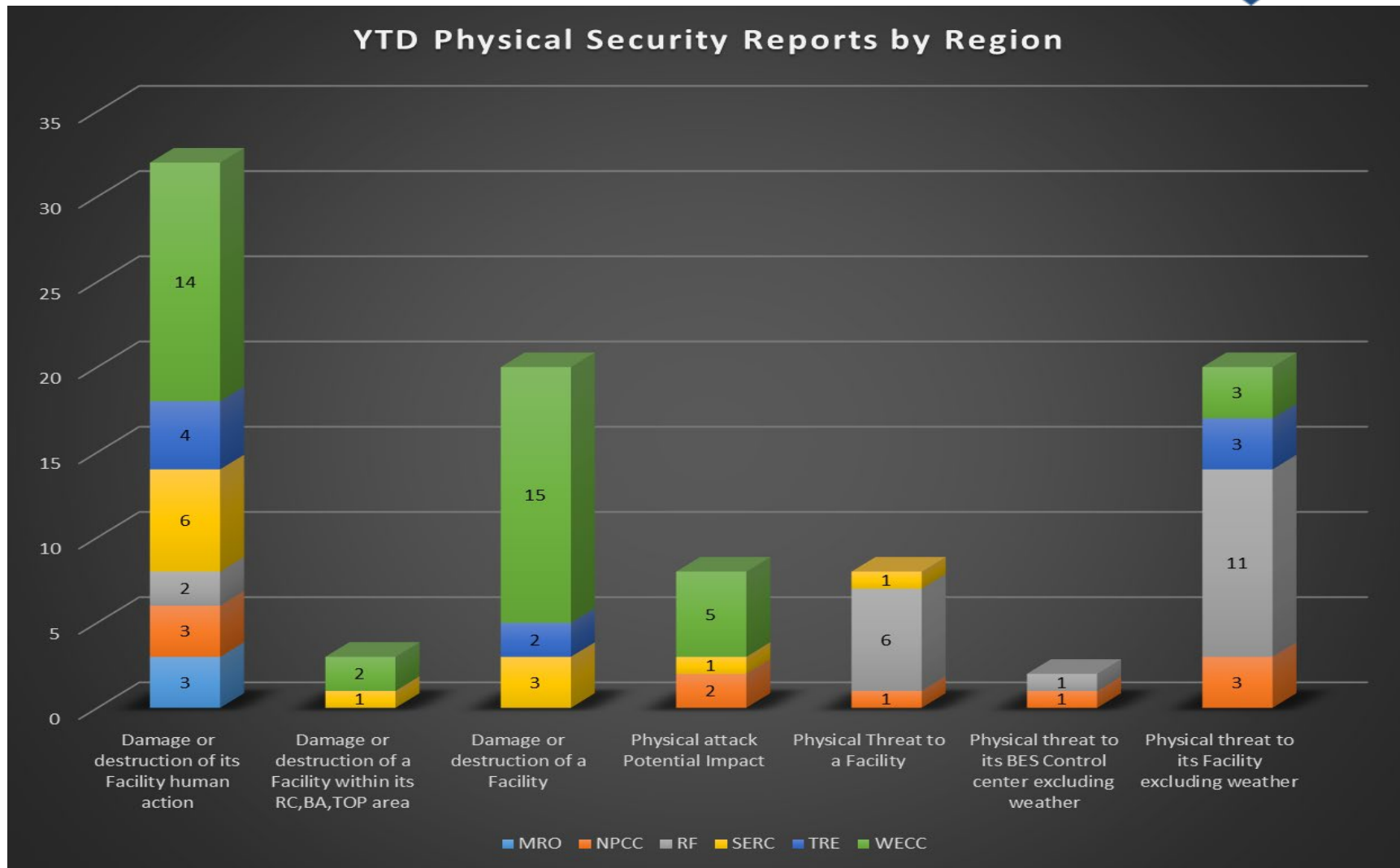


- For the Second Quarter of 2022, no widespread significant events were observed or reported on the North American bulk power system.
  - Several Reliability Coordinators declared Energy Emergency Alerts (EEA) Level 3 and shed firm load due to insecure operating states and loss of transmission due to severe storms and insufficient reserves.
  - Several severe storms across North America caused significant local distribution and transmission outages.
  - In ERCOT there was a large generation loss event which included approximately 1,709 MW of Inverter Based Resources tripping or temporarily reduced MW output and approximately 851 MW of thermal generation tripping for total combined generation loss of 2,560 MW.

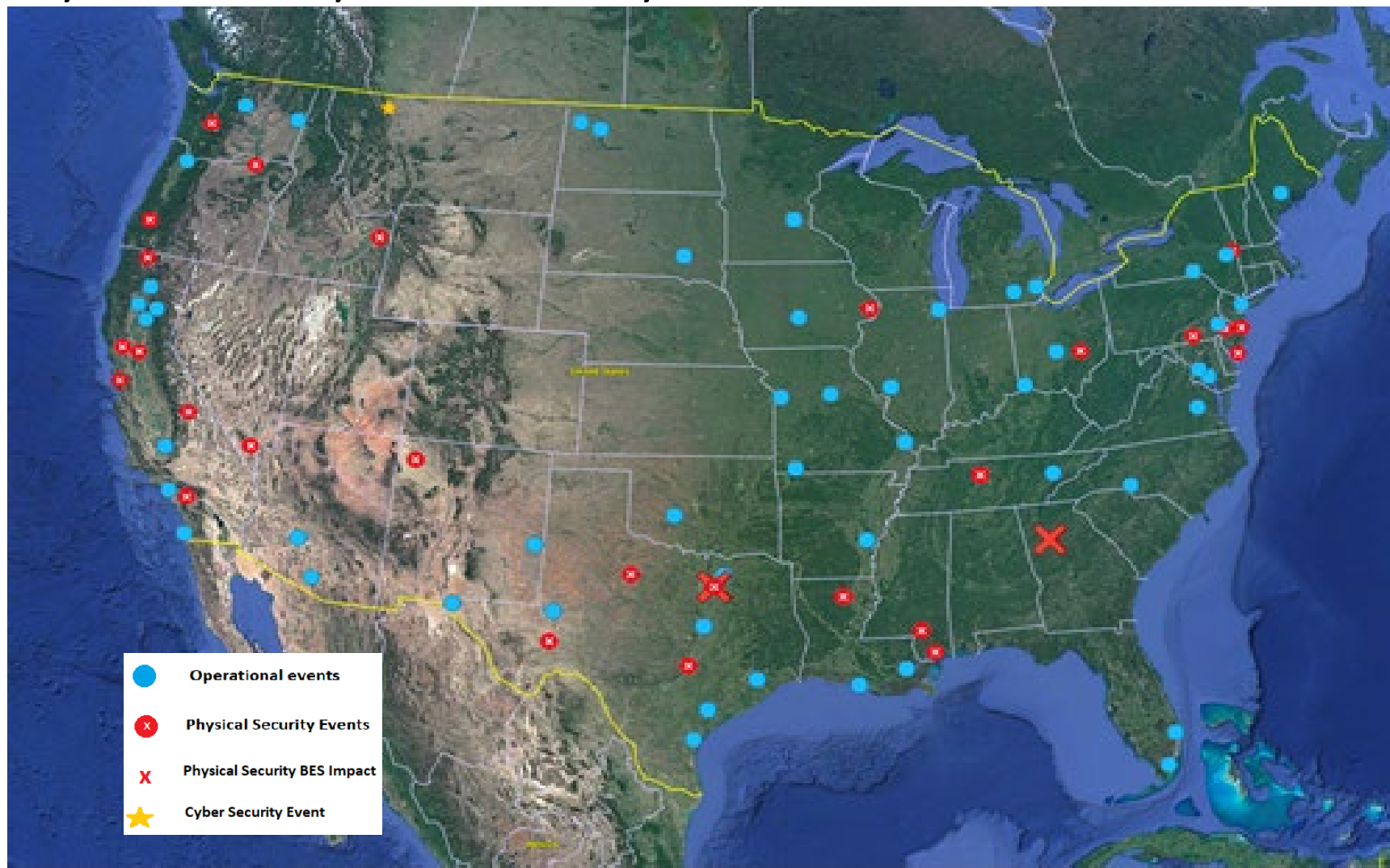






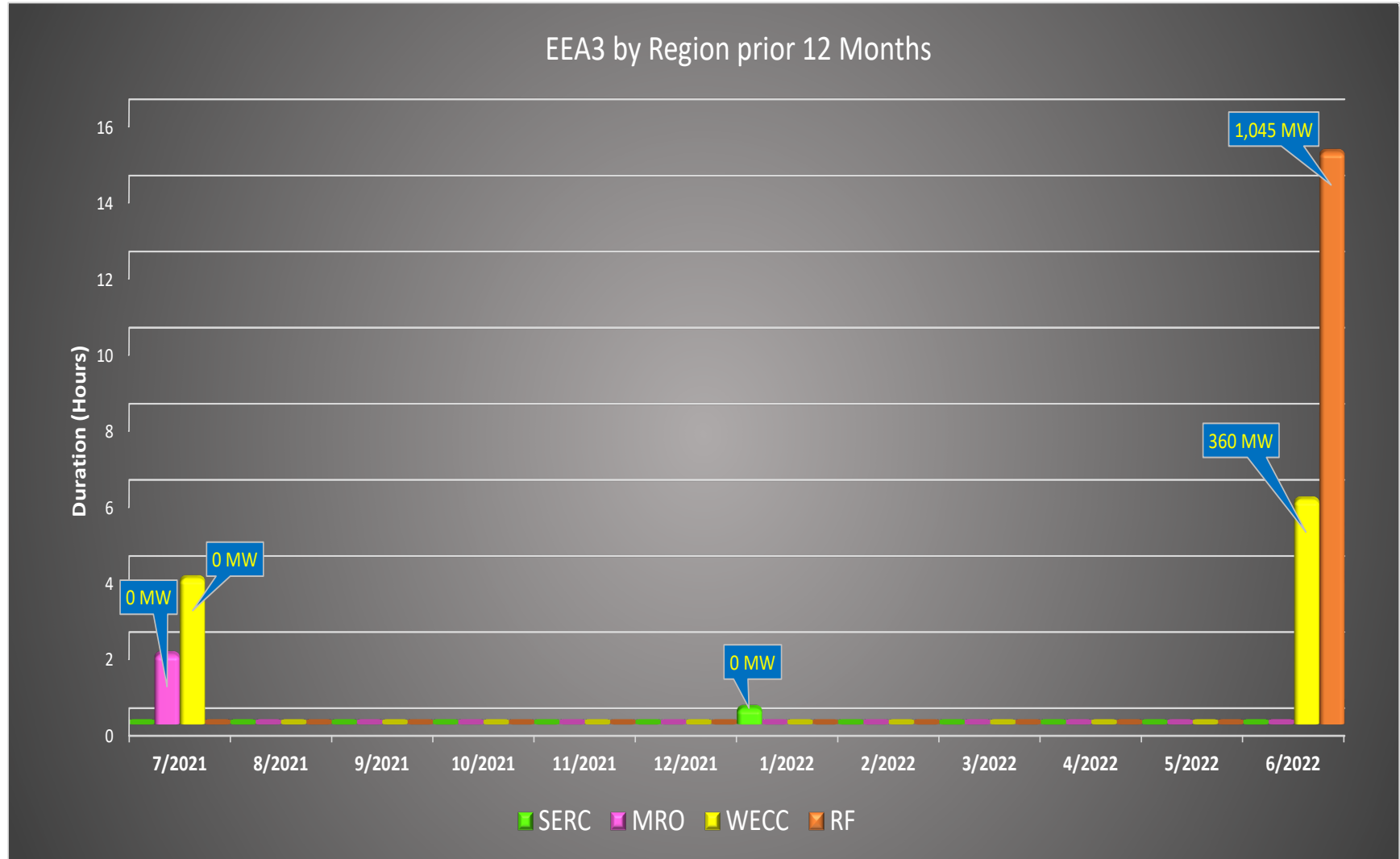


### Physical Security and Reliability Events





## EEA3 Reports – 12 month view





# Questions and Answers