

Agenda

NERC Quarterly Technical Session

May 10, 2023 | 1:30-3:30 p.m. Eastern

Hybrid Meeting

In-Person (*Board, MRC, NERC Staff ONLY*)

NERC DC Office
1401 H Street NW, Suite 410
Washington, DC 20005

Virtual Attendees

Webinar Link: [Join Meeting](#)

Password: AttendeesMay2023 (28836333 from phones and video systems)

Introduction and Chair's Remarks

NERC Antitrust Compliance Guidelines*

Agenda Items

1. Bulk Power System Awareness Update*
2. 2023 Summer Assessment*
3. 2023 State of Reliability Report*
4. Gas/Electric Coordination (NAESB/NERC Collaboration)*
5. Closing Remarks and Conclude Session

*Background materials included.

NERC 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.

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.

The presentation at the May 10, 2023, Quarterly Technical Session will provide a snapshot of the BPS and some of the reports/events/activities over the first quarter of 2023.

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RELIABILITY CORPORATION

Bulk Power System Awareness

Situational Awareness Q1 2023 Overview

Darrell Moore, Director

Bulk Power System Awareness and Personnel Certification

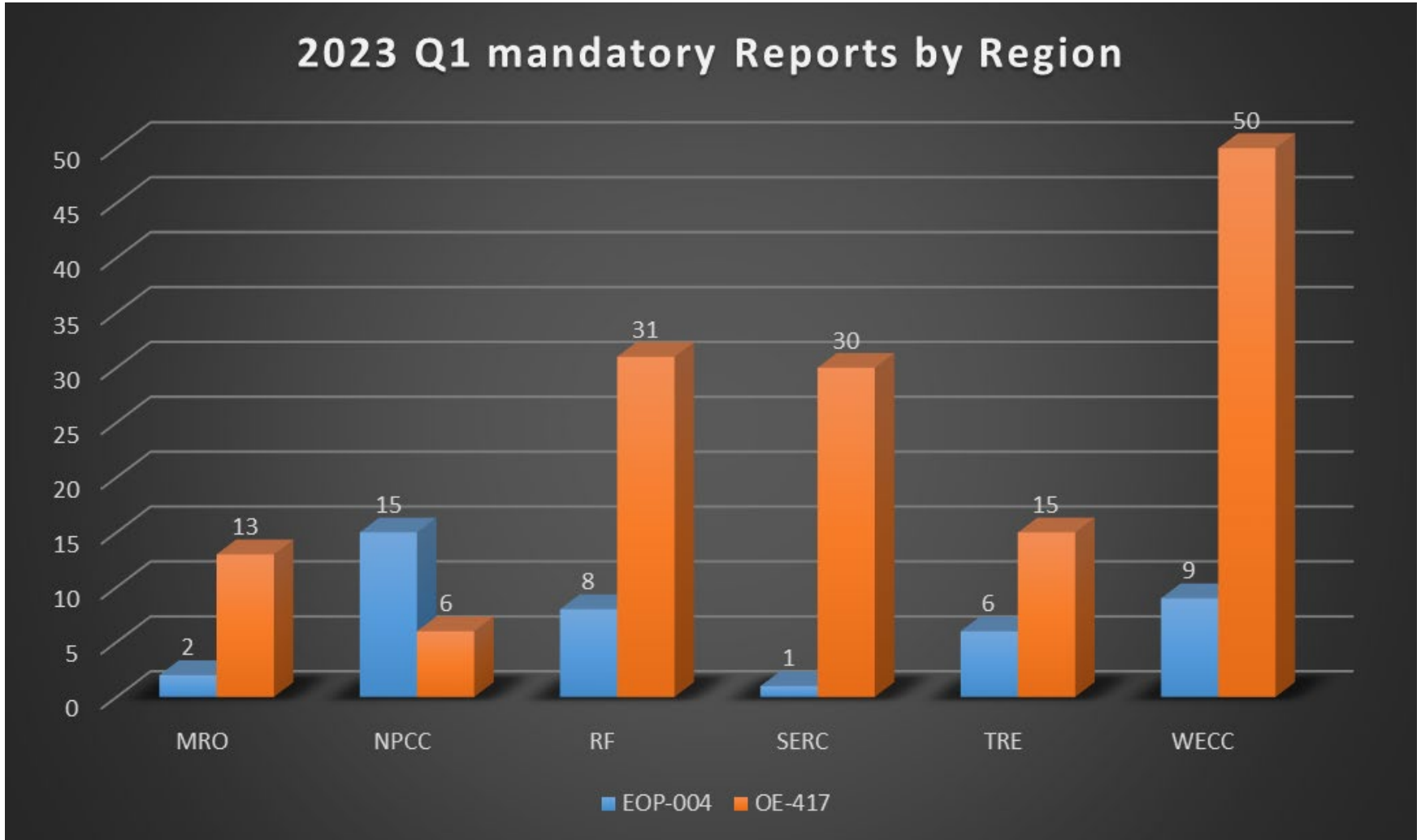
NERC Quarterly Technical Session

May 10, 2023

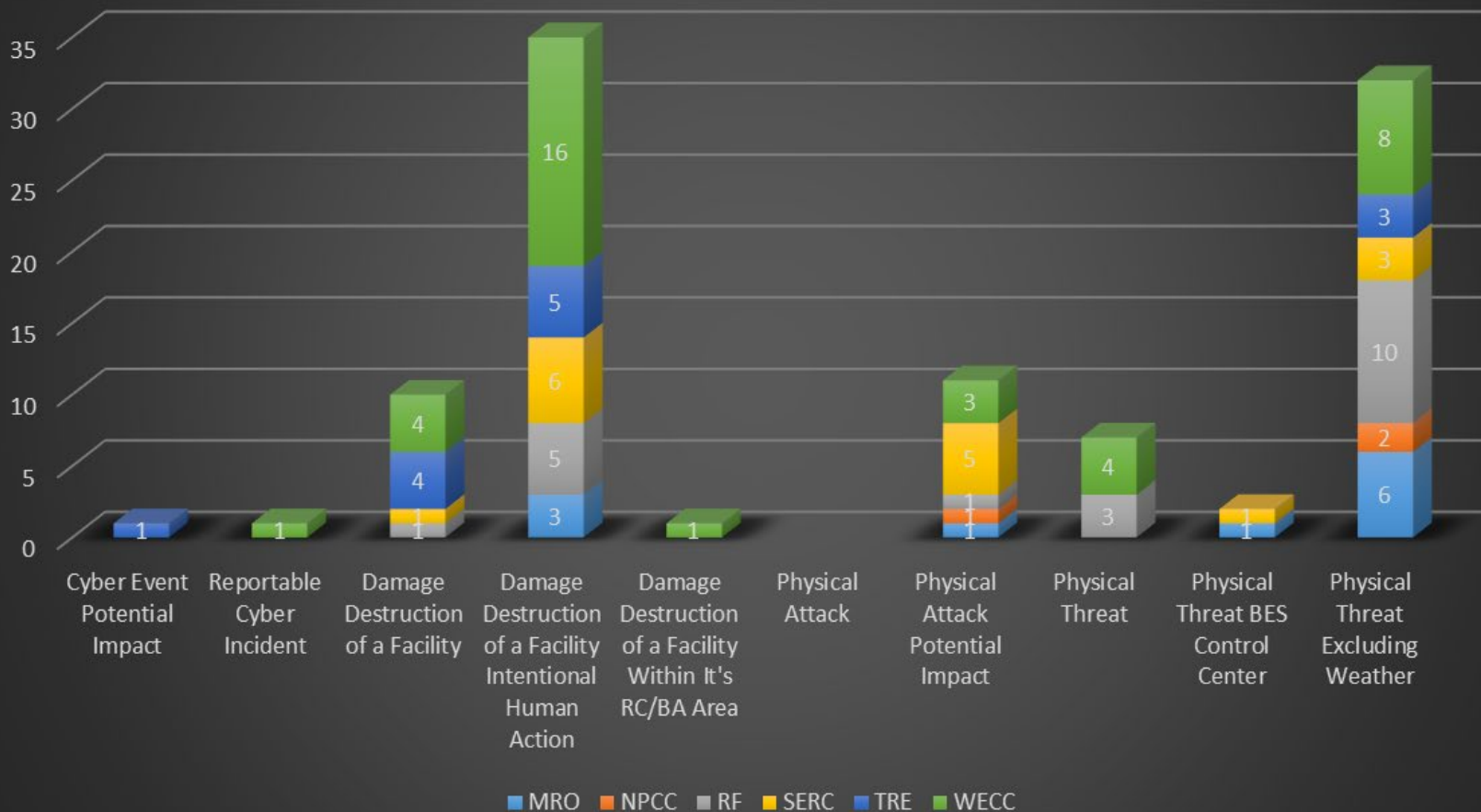
RELIABILITY | RESILIENCE | SECURITY

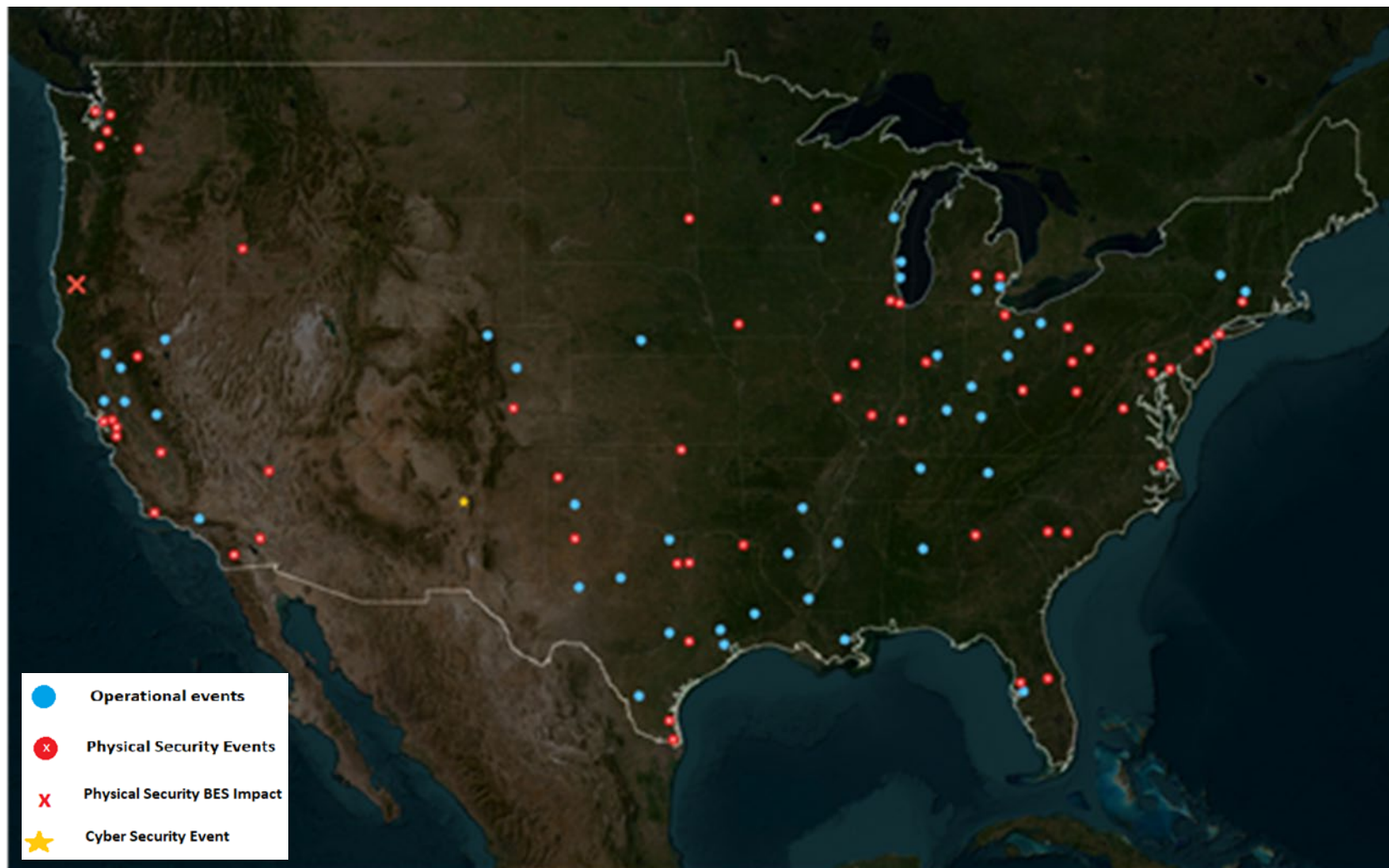


- For the First Quarter 2023, no widespread significant events were observed or reported on the North American bulk power system (BPS). NERC Bulk Power System Awareness did observe the following winter storms.
 - In early March a strong storm impacted the Central United States. During the peak of the storm there were approximately 1.5M customer outages.
 - In February there were multiple winter storms that moved across the Great Lakes region. During the peak of the storms there were approximately 949K distribution customers out of service. There were no observed or reported impacts to the BPS.

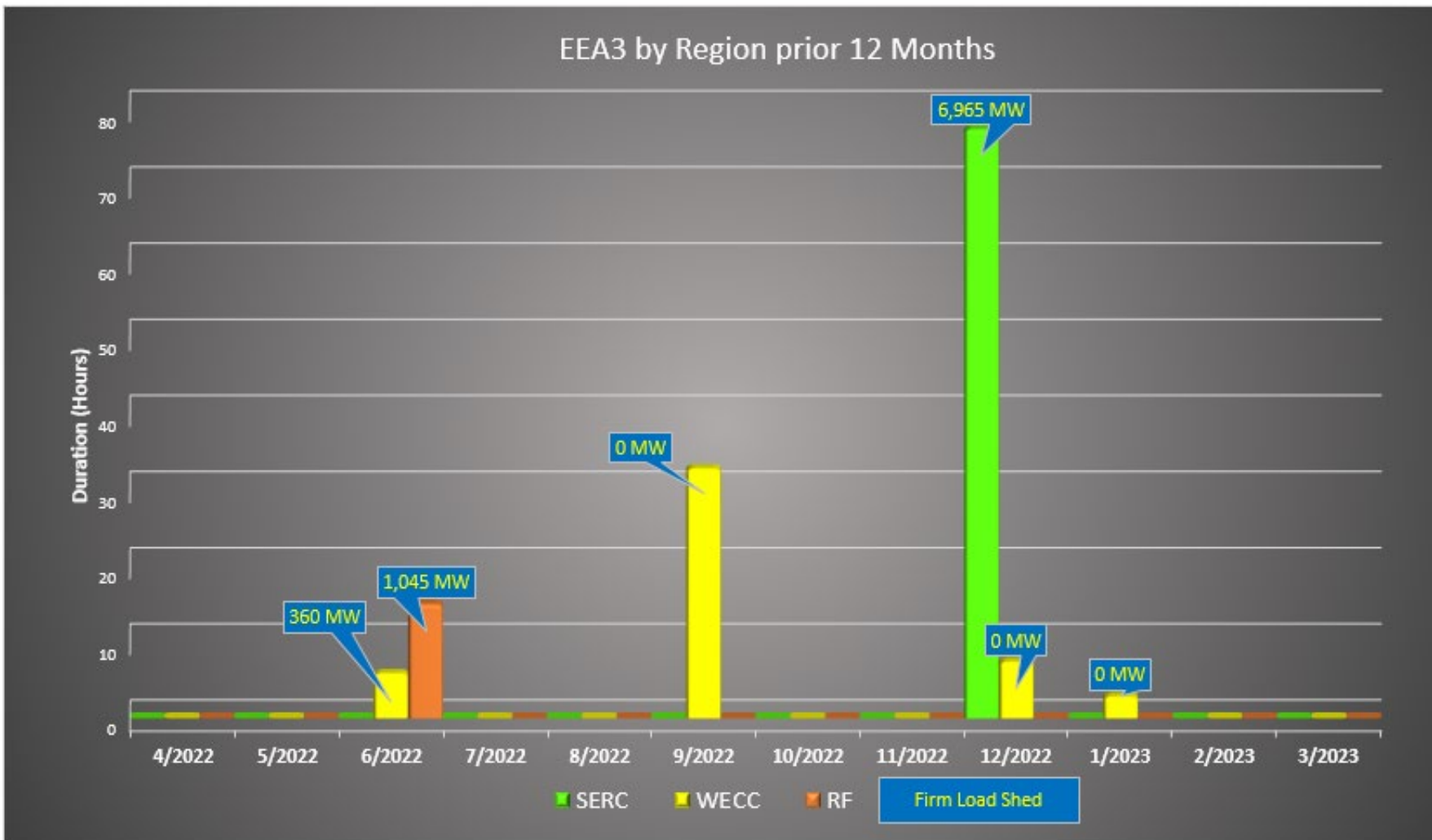


2022 Q1 Cyber and Physical Security Reports





EEA3 Reports – 12 month view





Questions and Answers

2023 Summer Reliability Assessment Preview

Action

Information

Summary

The NERC 2023 Summer Reliability Assessment (SRA) identifies, assesses, and reports on areas of concern regarding the reliability of the North American bulk power system (BPS) for the upcoming summer season. In addition, the SRA will present peak electricity supply and demand changes, as well as highlight any unique regional challenges or expected conditions that might impact the BPS. The reliability assessment process is a coordinated reliability evaluation between the Reliability Assessment Subcommittee (RAS), the Regional Entities, and NERC staff.

The final report reflects NERC's independent assessment and is aimed at informing industry leaders, planners and operators, as well as regulatory bodies so that they can be better prepared to take necessary actions to ensure BPS reliability. The report also provides an opportunity for the industry to discuss their plans and preparations for ensuring reliability throughout the upcoming summer period.

Pursuant to delegated authority from the Board of Trustees, NERC management expects to issue the SRA on or about May 17, 2023. The review schedule below identifies key milestones for the report.

Summer Reliability Assessment Review Schedule	
Date	Description
April	Draft sent to NERC Reliability and Security Technical Committee (RSTC)
May 9	Draft sent to NERC Executive Management
May 12	Final Report sent to NERC Board
May 15	Pre-publication Report sent to ERO Executive Committee and MRC
May 17	Report release

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2023 Summer Reliability Assessment Preview

Status and Preliminary Findings

John Moura, Director, Reliability Assessment and Performance Analysis

Mark Olson, Manager, Reliability Assessment

NERC Quarterly Technical Session

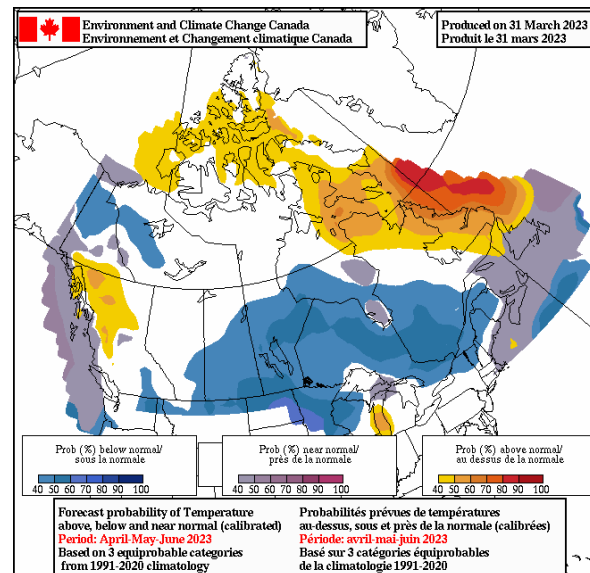
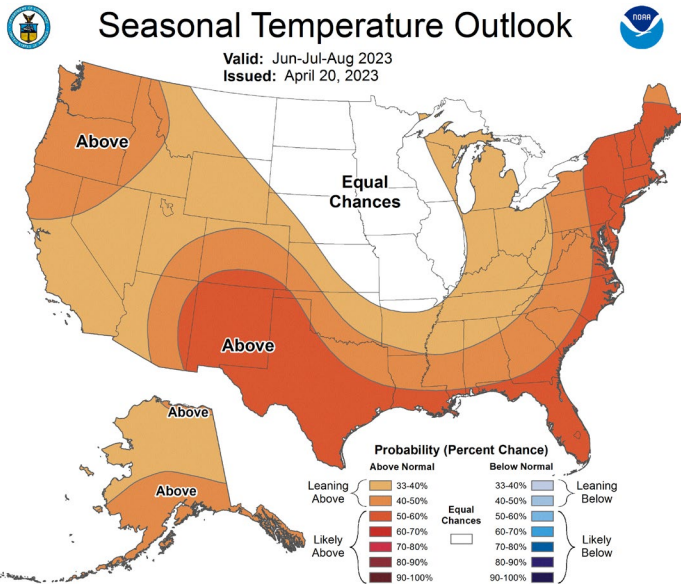
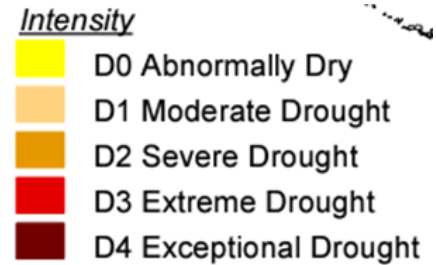
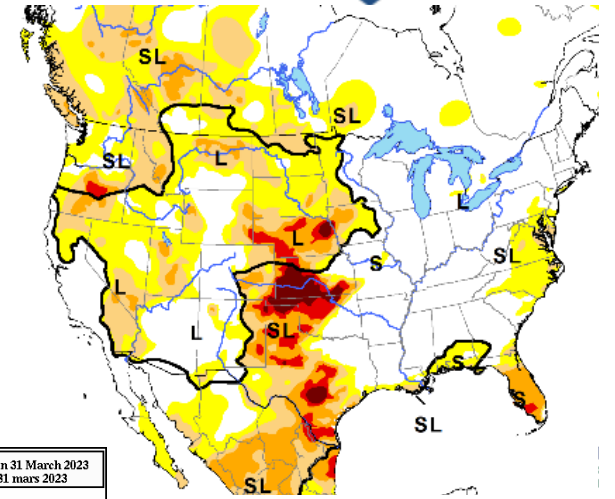
May 10, 2023

RELIABILITY | RESILIENCE | SECURITY



- System operators across North America can anticipate electricity supply shortages during periods of extreme demand
- Resources are adequate for normal summer peak demand
- Industry and stakeholders should prepare for new environmental rules affecting power plants to maximize generator availability
- Supply chain issues continue to challenge summer preparedness
- Unexpected tripping of wind and solar photovoltaic (PV) resources during grid disturbances continues to be a concern

- High temperatures are key driver of peak electricity demand
- Drought conditions are improving but could still impact generation, transmission



3-Month Temperature Outlook (U.S. National Weather Service, Environment and Climate Change Canada) and April North American Drought Monitor (NADM)

Supply shortages anticipated during extreme summer conditions

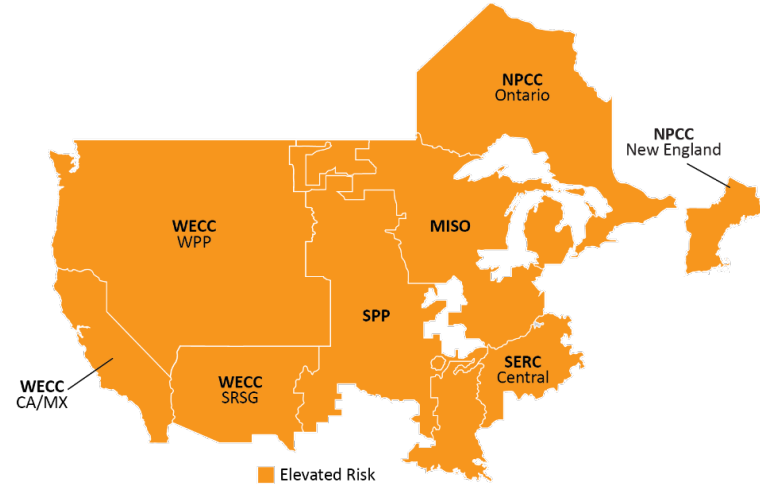
U.S. West: Wide-area heat events drive extreme demand and strain region resources and transmission network

SPP and MISO: Wind energy output is key to meeting normal summer peak demand and more extreme demand levels

Ontario: Extended nuclear refurbishment has reduced available capacity resulting in limited reserves to manage peak demand

SERC-C: Higher peak demand forecast and less supply capacity will challenge operators to maintain reserves in extreme scenarios

New England: Less capacity will challenge operators to maintain reserves in extreme scenarios



Seasonal Risk Assessment Summary	
High	Insufficient Operating Reserves at Normal Peak
Elevated	Insufficient Operating Reserves in Extreme Conditions
Low	Sufficient Operating Reserves

Extreme summer conditions include 90/10 demand scenarios, historical high generator outage rates, and low variable energy resource scenarios

- Low inventories of replacement distribution transformers could slow restoration efforts following hurricanes and severe storms
- Local coal supply issues in the U.S. southeast where some coal-fired generators are encountering replenishment challenges
- Curtailment of electricity transfers to areas in need during periods of high Regional demand is a growing reliability concern

- Reliability Coordinators (RC), Balancing Authorities (BA), and Transmission Operators (TOP) in elevated risk areas review operating plans and protocols for resolving supply shortfalls
 - Employ conservative outage coordination procedures
 - Engage state or provincial regulators and policymakers to prepare for efficient implementation of demand side management mechanisms
- GOs with solar PV resources implement recommendations in NERC's *Inverter-Based Resource Performance Issues Alert (Level 2)*
- RCs, BAs, and GOs in states affected by the new Good Neighbor Plan should be familiar with its provisions for ensuring reliability
- State regulators and industry should have protocols in place at the start of summer for managing emergent requests to preserve generation needed for periods of high demand

- The SRA report was reviewed by the NERC Reliability and Security Technical Committee (RSTC) in April
- Risk analysis is based on inputs from probabilistic studies and deterministic risk scenarios
- NERC Staff is preparing the report for approval

Date	Milestone
May 15	Final Report sent to NERC Board of Trustees
May 16	Pre-publication Report sent to ERO Executive Committee and MRC
May 17	Report Release
Late May	Industry Webinar



Questions and Answers

2023 State of Reliability Report

Action

Information

Summary

The State of Reliability Report (SOR) is prepared annually to provide objective, credible, and concise information to policy makers, industry leaders, and the NERC Board of Trustees (Board) on issues affecting the reliability and resilience of the North America BPS. Specifically, the report:

- Identifies system performance trends and emerging reliability risks;
- Determines the relative health of the interconnected system; and
- Measures the success of mitigation activities deployed.

The key findings and recommendations of the report serve as the technical foundation for NERC's range of risk-informed efforts addressing reliability performance and serve as key inputs to the ERO Reliability Risk Priorities Report prepared by the Reliability Issues Steering Committee. The metrics measured in the report address the characteristics of an adequate level of reliability.

In developing the 2023 SOR, NERC staff and the Performance Analysis Subcommittee continue to tailor content for the policy maker and industry leader audience. NERC management expects to issue the 2023 SOR in June. The review schedule below identifies key milestones for the report.

2023 State of Reliability Report Schedule	
Date	Description
May 15	Presentation to RSTC, Beginning of Review Period
June 6	RSTC Endorsement
Mid-June	Board and MRC Review; Report Acceptance
June 22	Report release (target)

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2023 State of Reliability Report

Preview

Donna Pratt, Manager, Performance Analysis
NERC Quarterly Technical Session
May 10, 2023

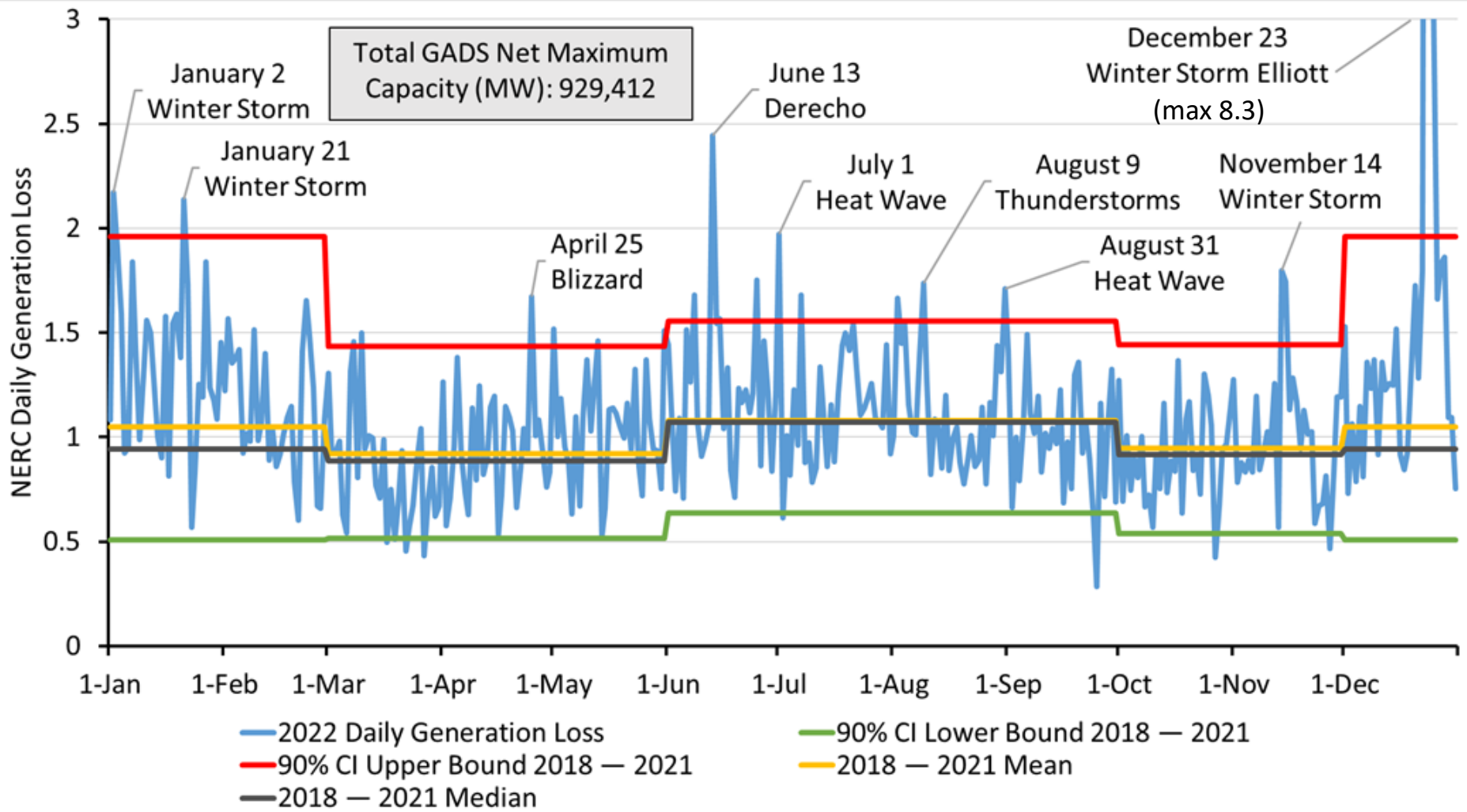
RELIABILITY | RESILIENCE | SECURITY



- Provide objective, credible, and concise information to policy makers, industry leaders, and the NERC Board of Trustees on issues affecting the reliability and resilience of the North American bulk power system (BPS)
 - Identify system performance trends and emerging reliability risks
 - Determine the relative health of the interconnected system
 - Measure the success of mitigation activities deployed
- Evaluates the 2022 Operating Year and Historical Trends

- Conventional generation reliability is challenged during extreme weather events and other high-demand conditions
- Grid disturbances continue to highlight solar photovoltaic (PV) resources' inconsistent "ride through" functionality
- Security threat landscape relentlessly evolves and continues to present new challenges to the electricity industry
- The BES transmission system continues to demonstrate significantly improved reliability for the 5th year in a row

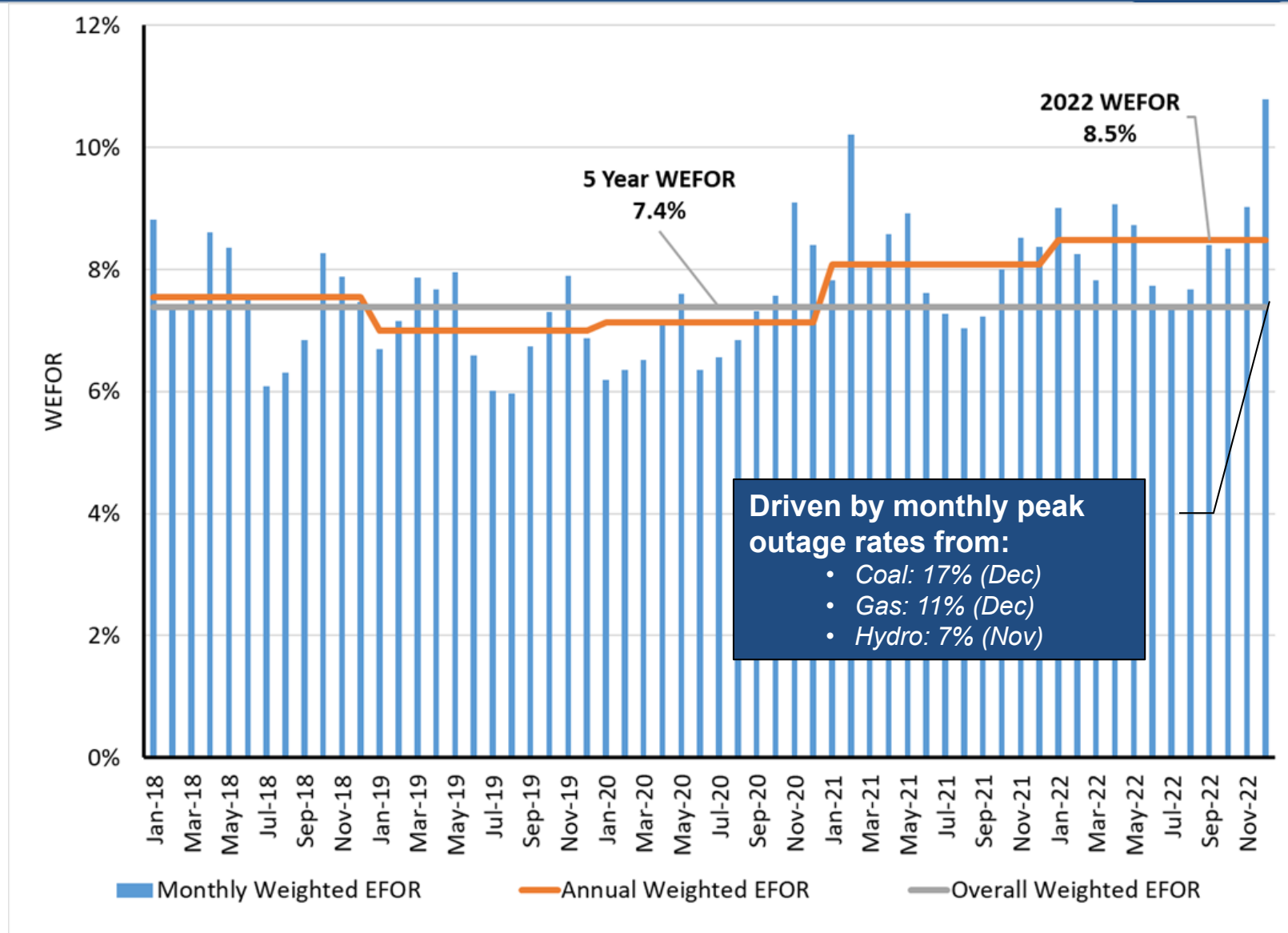
Key Finding: Conventional Generation Challenged During Extreme Weather



Leading Cause of Outages on Extreme Days:

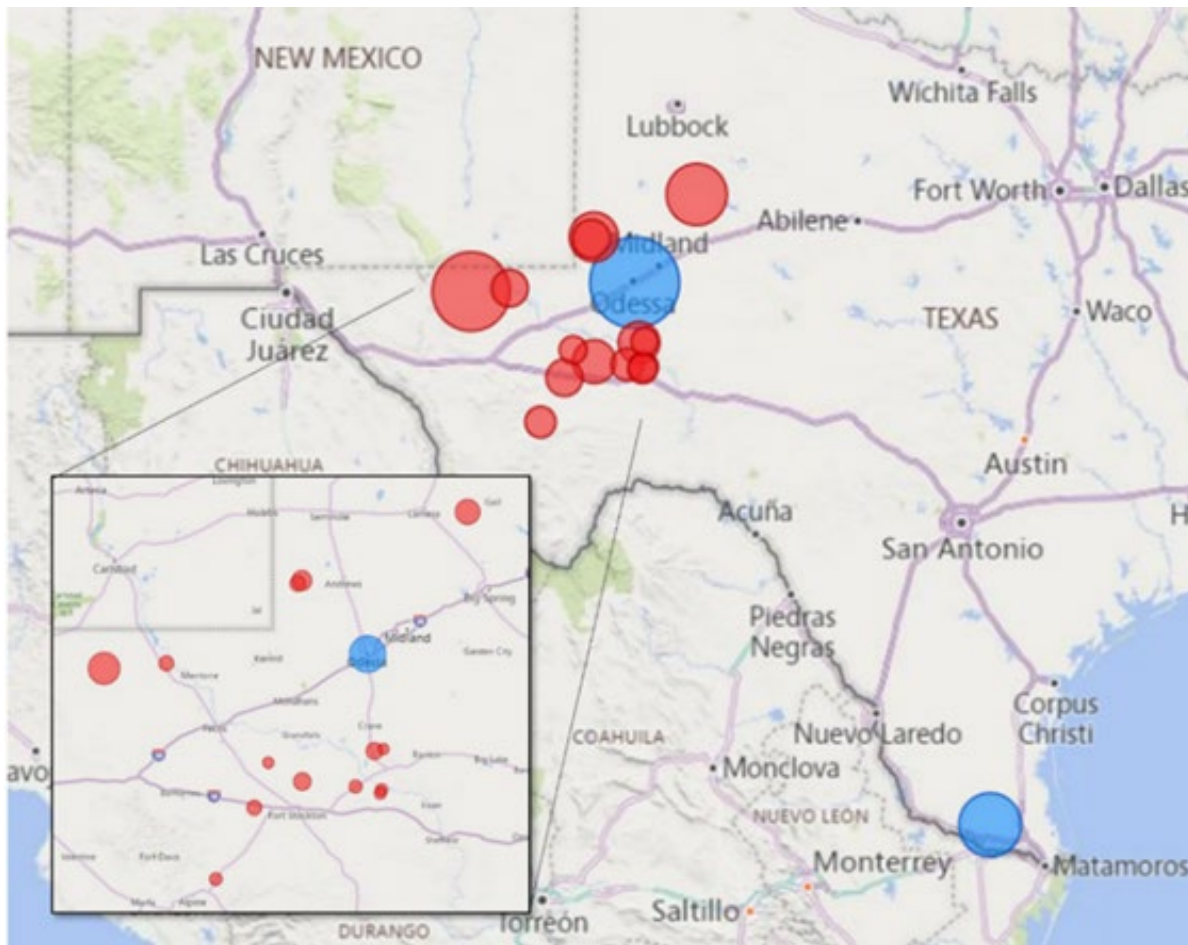
- 1) Fuel Systems, 2) Electrical 3) Auxiliary Systems

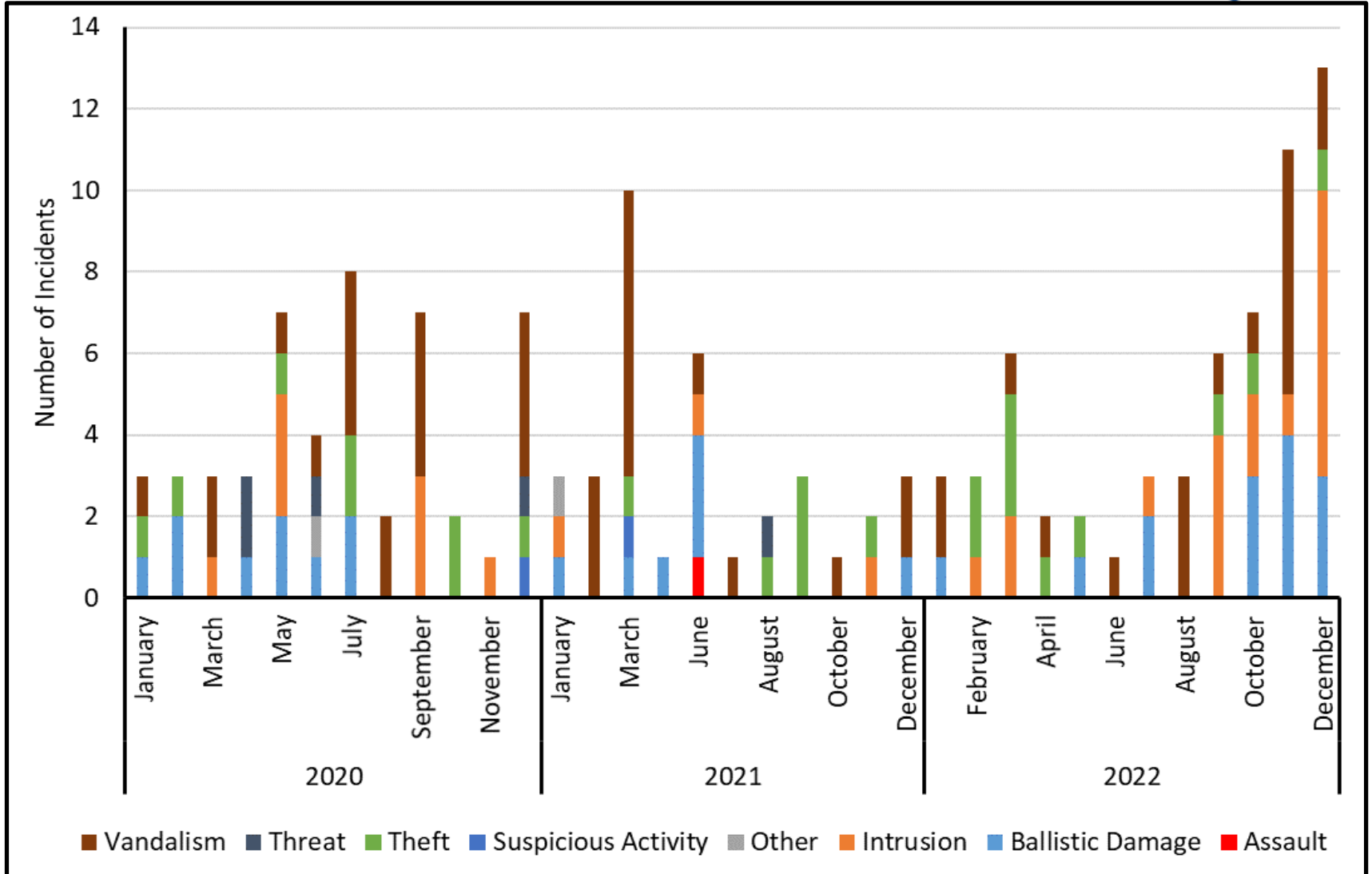
Generation Forced Outage Rate: Conventional Fleet



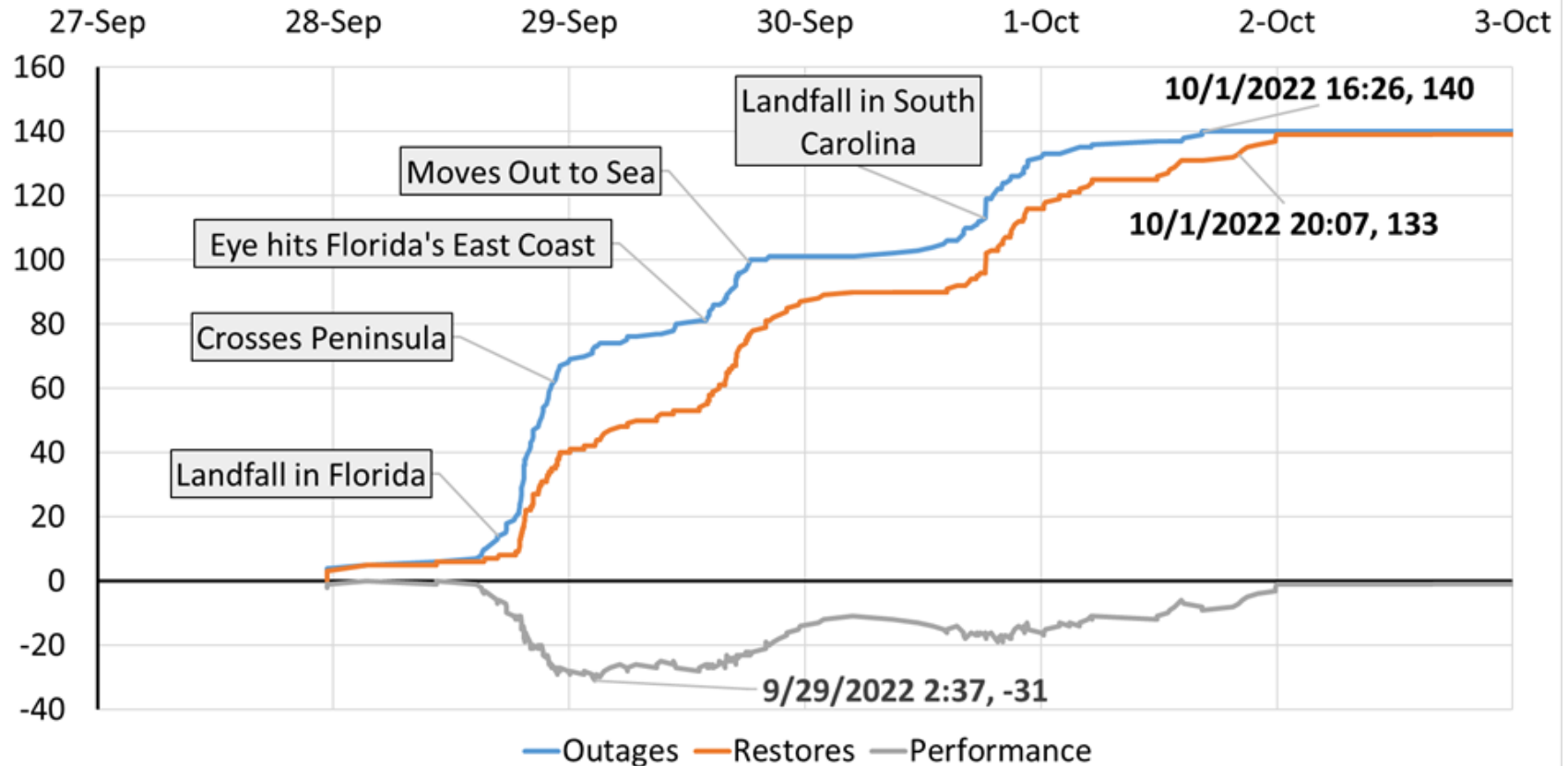
Key Finding: Grid Disturbances due to Abnormal Performance of Solar Photovoltaic (PV) Plants

- June 4, 2022, over 1700 MW of solar PV resource power output was lost up to several hundred miles away from the location of the initiating event, a single-line-to-ground fault at a 345 kV substation near Odessa, Texas
- Nearly identical to an event that occurred just over one year prior at the same location
- The size of the loss nearly exceeded the Texas Interconnection Resource Loss Protection Criteria





140 Outages, Eastern Interconnection



Peak Outage: 13,515 MVA
Time to first restoration: 1 minute
95% restoration: 3.8 days
Total restoration: 14.6 days Florida (3.8 days), East Coast (12.9 days)

4,674,290 GWh
2022 Actual Energy

1,057,455 MW
2022 Summer Peak Capacity

522,665 mi
Total Transmission Circuit Miles > 100kV

5,910
Number of Conventional Generating Units > 20MW

1
Category 3, 4, or 5 Events
(non-weather related)

99.56%

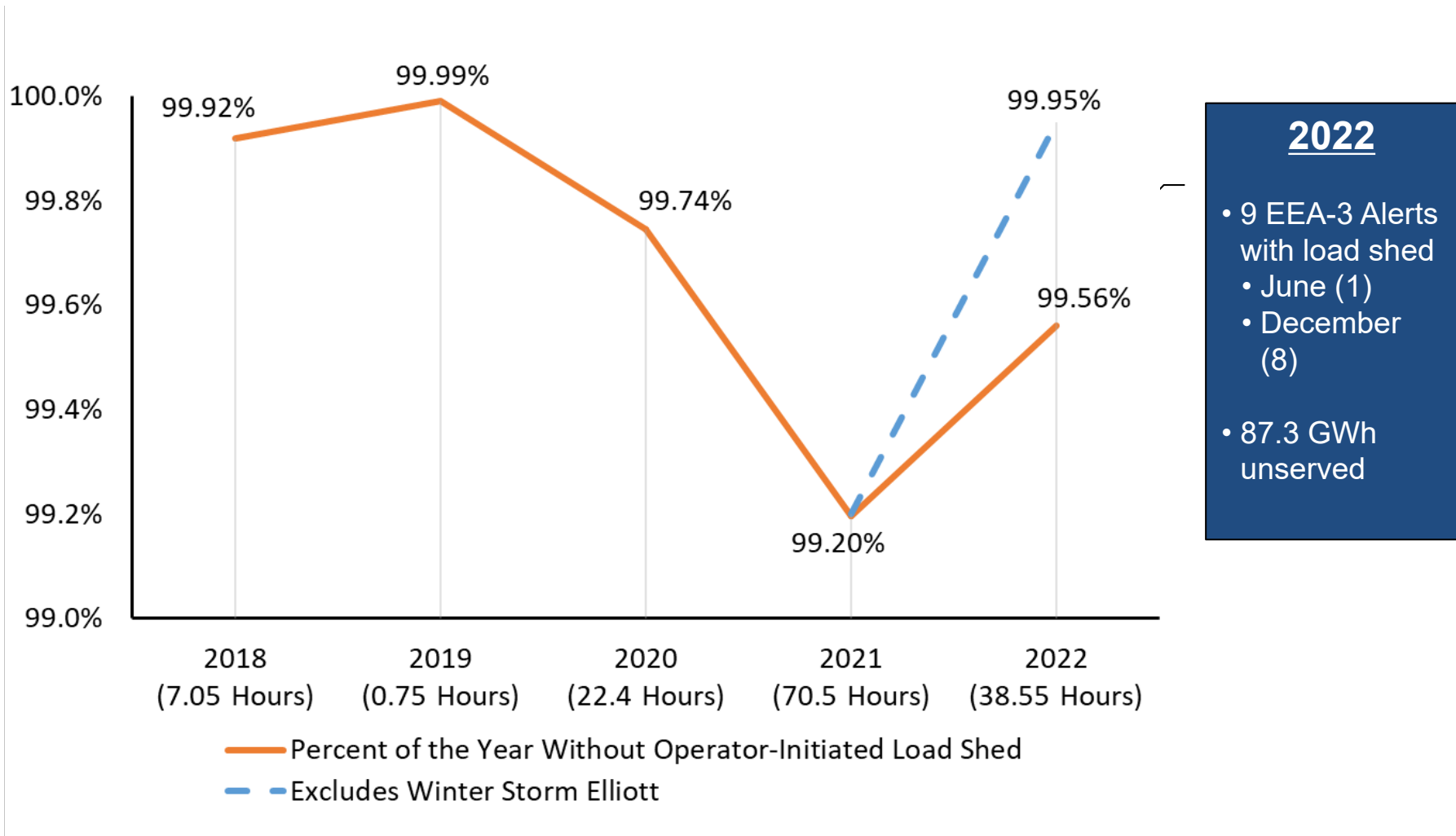
Time with no operator-initiated
firm load shedding associated with EEA-3

87.53 GWh

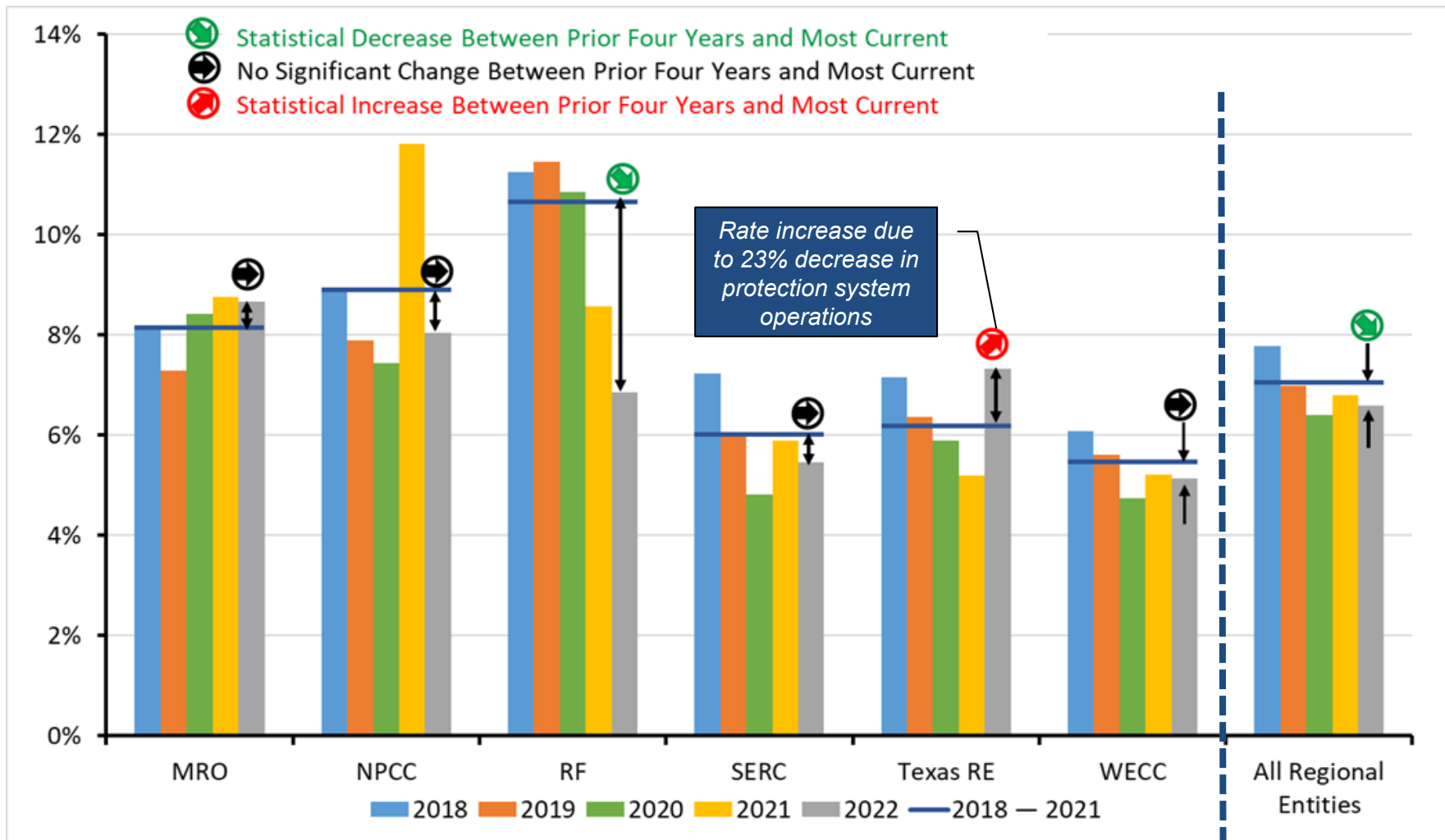
Amount of unserved energy associated
with EEA Level 3 in 2022 (decrease in
unserved energy compared to 2021)



Hours Without Operator-Initiated Firm Load Shed (%/year)



Protection System Misoperations Continue to Improve



- May 15 – June 6
 - Presentation to RSTC, review and endorsement
 - Review period for NERC Board of Trustees and MRC
- Late June
 - Report release (target)



Questions and Answers

Gas/Electric Coordination (NAESB/NERC Collaboration)

Action

Information

Summary

The chairman of the North American Energy Standards Board (NAESB) will provide an update on NAESB's efforts to address key recommendation #7 in NERC/FERC's report on Winter Storm URI highlighting progress, key takeaways and next steps.

NERC Technical Session

May 10, 2023

NAESB Gas-Electric Harmonization Forum



NORTH AMERICAN ENERGY
STANDARDS BOARD

Quick Facts

1994

GISB
Founded

28

Years of Standards
Development

American National
Standards Institute
(ANSI) Accreditation

2001

NAESB
Established

4,000+

Standards

**Oct.
2001**

Mission & Government Coordination

The North American Energy Standards Board serves as an industry forum for the development and promotion of standards to support the wholesale and retail natural gas and electricity markets

Department of
Energy

Federal Energy
Regulatory
Commission

National
Association of
Regulatory Utility
Commissioners

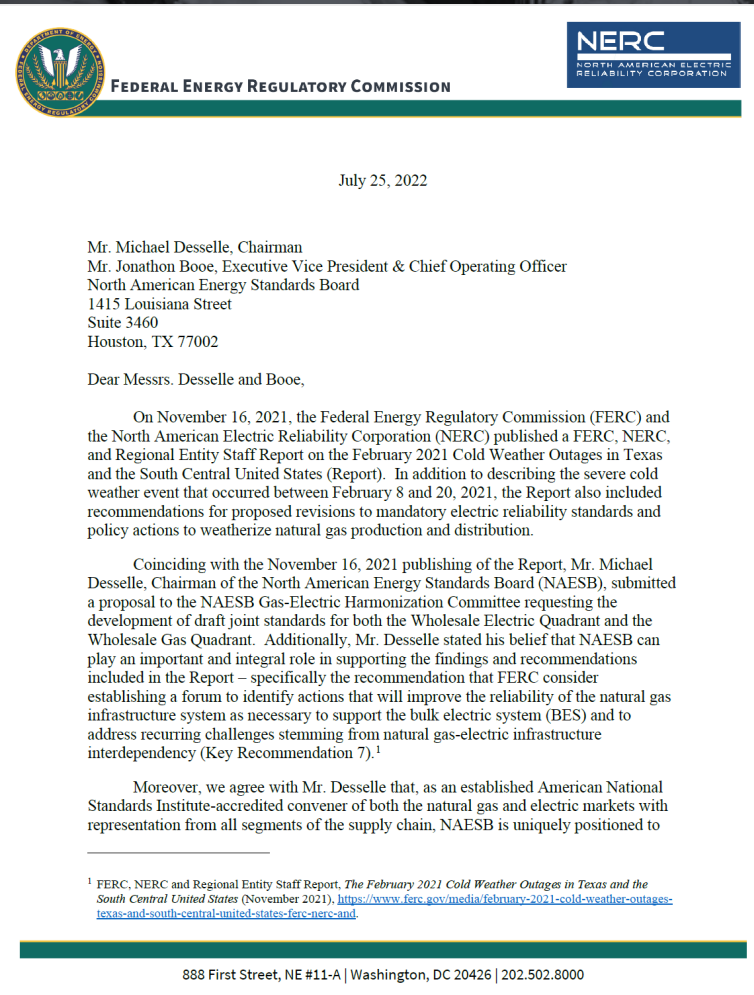
National Institute
of Standards and
Technology

North American
Electric Reliability
Corporation

National
Petroleum Council

NAESB GEH Forum

Background Information



FERC & NERC Request – July 25, 2022

- Issuance of the FERC-NERC-Regional Entity Staff Report: February 2021 Cold Weather Outages in Texas and the South Central United States – November 2021
- Southwest Power Pool NAESB Standards Request (R21006)
- *“As an established American National Standards Institute-accredited convener of both the natural gas and electric markets with representation from all segments of the supply chain, NAESB is uniquely positioned to provide support in addressing the Report recommendation [Key Recommendation 7]”*

NAESB Gas Electric Harmonization (GEH) Forum – August 30, 2022

- Reactivation of the NAESB Gas-Electric Harmonization Forum
- Chaired by Pat Wood, Sue Tierney, and Bob Gee
- Participation by Nearly 500 Industry Representatives
- Comments from Chairman Glick, Jim Robb, and Greg White
- FERC & NERC Staff Presented Key Recommendation 7 & Defined Scope
- Forum Outcome Goals
 - Concrete actions to increase reliability of natural gas infrastructure system necessary to support Bulk Electric System
 - Plans for implementing actions
 - Deadlines for implementation actions
 - Identification of entities responsible for implementing actions

NAESB GEH Forum

Key Recommendation 7 Scope of Work



NORTH AMERICAN ENERGY
STANDARDS BOARD

Three Categories & Seventeen Topics

“FERC should consider establishing a forum in which representatives of state legislatures and/or regulators with jurisdiction over natural gas infrastructure, in cooperation with FERC, NERC and the Regional Entities (which collectively oversee the reliability of the Bulk Electric System), and with input from the Balancing Authorities (which are responsible for balancing load and available generation) and natural gas infrastructure entities, identify concrete actions (consistent with the forum participants’ jurisdiction) to improve the reliability of the natural gas infrastructure system necessary to support the Bulk Electric System.”



Measures to improve gas-electric information-sharing for improved system performance during extreme cold weather emergencies



Measures to improve reliability of natural gas facilities during cold weather (freeze protection, electric supply)



Measures to improve the ability of generators to obtain fuel during extreme cold weather events when natural gas heating load & natural gas-fired generators are both in high demand for natural gas, at the same time that natural gas production may have decreased

NAESB GEH Forum

Meetings & Participation



Forum Meetings September 2022 – April 2023

- 8 meetings to date, each providing an opportunity to respond to specific questions offered by the Chairs of the NAESB GEH Forum through written comments or during the meeting intended to solicit recommendations related to the categories identified by FERC and NERC staff
- Over 430 individuals representing more than 230 organizations have participated on our calls since September
- Nearly 100 sets of comments from over 30 organizations/groups have been submitted since September
- Over 300 proposals / data points have been offered through written comments, oral comments during meetings, or through the chat function of the Zoom Platform
- The February survey solicited responses on the individual recommendations/proposals captured in the record and asked respondents to state their support or opposition for continued consideration of the item and to rank the priority that should be given to the items they supported.

NAESB GEH Forum

Example of Discussion Areas To Date

Measures to improve gas-electric information-sharing for improved system performance during extreme cold weather emergencies

- Electric market clearing times (multi-day clearing)
- Nomination cycle and natural gas scheduling processes (weekends/holidays)
- Critical notices and operational flow orders
- Contract Information
- Development of voluntary industry tools and/or natural gas coordinator
- Expansion of demand response/interruptible customer programs
- Exchange agreements between commercial and industrial end users and generators
- Asset management agreements
- Expansion of secondary/capacity release markets
- Increased upstream information sharing
- Clarification of FERC Order No. 787
- Forecasting/planning processes

Measures to improve reliability of natural gas facilities during cold weather (freeze protection, electric supply)

- Weatherization strategies, requirements, incentives
- State actions to incentivize natural gas storage/firm transportation
- Potential reliability standards organization for intrastate natural gas pipelines
- State actions to promote increased/standardized information sharing and transparency
- Federal-state information sharing programs
- Emergency preparedness plans



Measures to improve the ability of generators to obtain fuel during extreme cold weather events when natural gas heating load & natural gas-fired generators are both in high demand for natural gas, at the same time that natural gas production may have decreased

- Compensation mechanisms for firm transportation/dual fuel
- Additional infrastructure/permitting process reform
- Emergency response waivers and cost recovery for LNG
- Fuel prioritization during critical periods
- Resource accreditation requirements
- Resource adequacy planning
- Pipeline storage and reserve capacity
- Increased utilization of LNG and alternative Fuels

NAESB GEH Forum

Path Forward to Final Report



Current Focus

- April 27th Meeting – Will focus specifically on the items identified in Key Recommendation 7 within Category 2 that would benefit from additional industry input
 - Survey/request for comments open through April 24th
- May 17th Meeting - – Will focus specifically on the items identified in Key Recommendation 7 within Category 3 that would benefit from additional industry input

Next Steps

- Additional meetings to be scheduled over the summer with a goal of submitting a final report at the end of July
- Dates and format of meetings have not been determined but information will be provided in the coming weeks
- Final report will follow the format of other reports developed by NAESB providing a full and transparent record that includes the positions of the industry segments on any recommendations as determined by the NAESB balanced voting process

NAESB Contact Information

- GEH Forum Website:
https://naesb.org//naesb_geh_forum.asp
- Phone – 713-356-0060
- Fax – 713-356-0067
- Email – naesb@naesb.org



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