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NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Standards Actions

Howard Gugel, Vice President of Compliance Assurance and Registration
Board of Trustees Meeting
May 11, 2023

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- Texas RE revised Regional Standard Development Process (RSDP)
 - Promote consistency
 - Provide clarity
 - Enhance efficiency
 - Promote stakeholder participation
- Approve Texas RE RSDP

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Standards Process Improvements Update

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- Standards Process Stakeholder Engagement Group made process improvement recommendations in four areas:
 - Rules of Procedure
 - Standard Processes Manual
 - Standing Committees
 - Registered Ballot Body (*deferred*)
- The Board directed NERC staff to implement recommendations

- Posted for comment January 18, 2023 -March 6, 2023
- Proposed Revisions:
 - Remove requirement for the American National Standards Institute (ANSI) accreditation
 - Provide Board authority to direct the development of a Reliability Standards
 - Modify section 321 to include projects to address Board directives
- NERC staff reviewing comments

- First draft posted for initial formal comment period and ballot
January 18, 2023 – March 6, 2023
- First draft proposals included:
 - Revisions to reflect that NERC's process is modeled on the ANSI Essential Requirements
 - Revisions to clarify requirements for informal postings of Standard Authorization Requests
 - Revisions to implement a tiered structure for length of comment periods
 - Revisions to eliminate the requirement for a final ballot
- Initial ballot unsuccessful (37.7% approval / 83.46% quorum)

- Second draft SPM posted for an additional formal comment period and ballot through May 30, 2023
- Second draft proposals respond to comments and include:
 - Clarification that NERC has a statutory obligation to maintain a fair and open process for standards
 - Revisions to implement an adjusted tiered structure (45 and 30 days)
 - Revisions to allow a drafting team the option to skip a final ballot, with qualifications
 - Removal of references to Rules of Procedure proposals

- On March 22, the Standards Committee approved a work plan to implement the Standards Process Stakeholder Engagement Group (SPSEG) recommendations:
 - Streamlining drafting team appointments
 - Providing guidance in the role and procedural administration of Standard Authorization Requests, including when they may be posted for informal comment
 - Committee charter enhancements
 - Recommendations for the Executive Committee to streamline meetings and consider broader use of existing SPM authorities
 - Updating drafting team reference materials as appropriate
- Work to continue in 2023

- SCCG met in 1Q 2023 to discuss implementing the SPSEG recommendations:
 - Review the Standard Authorization Request form and recommend enhancements
 - Review new standards projects to aid in effective project prioritization
 - Expand participation in the standards quality review process
- Work to continue in 2023

- The RSTC met in 1Q 2023 to discuss ways to enhance its process for endorsing draft SARs and improve transparency and stakeholder awareness of the process
- Work to continue in 2023

- Stakeholder engagement critical to success
- Multiple opportunities for stakeholders to participate
 - Comments and voting on SPM changes
 - Participation in Standards Committee Process Subcommittee
 - Contact committee representatives or NERC staff with suggestions and feedback



Questions and Answers

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Inverter-based Resource Workplan

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Risk Analysis

Event Analysis

Disturbance
Reports

Alerts

Lessons Learned

Interconnection Process Improvements

Improvements
to GIAs and GIP

Enhanced
Interconnection
Requirements

Modeling and
Study
Improvements

IEEE 2800-2022

Best Practices and Education

Reliability
Guidelines

Webinars and
Workshops

Outreach and
Engagement

Emerging
Reliability Risk
Issues

Regulatory Enhancements

NERC Standards
Projects

BES Definition
Review

Inverter-Specific
Requirements
and Standards

Risk-Based
Compliance

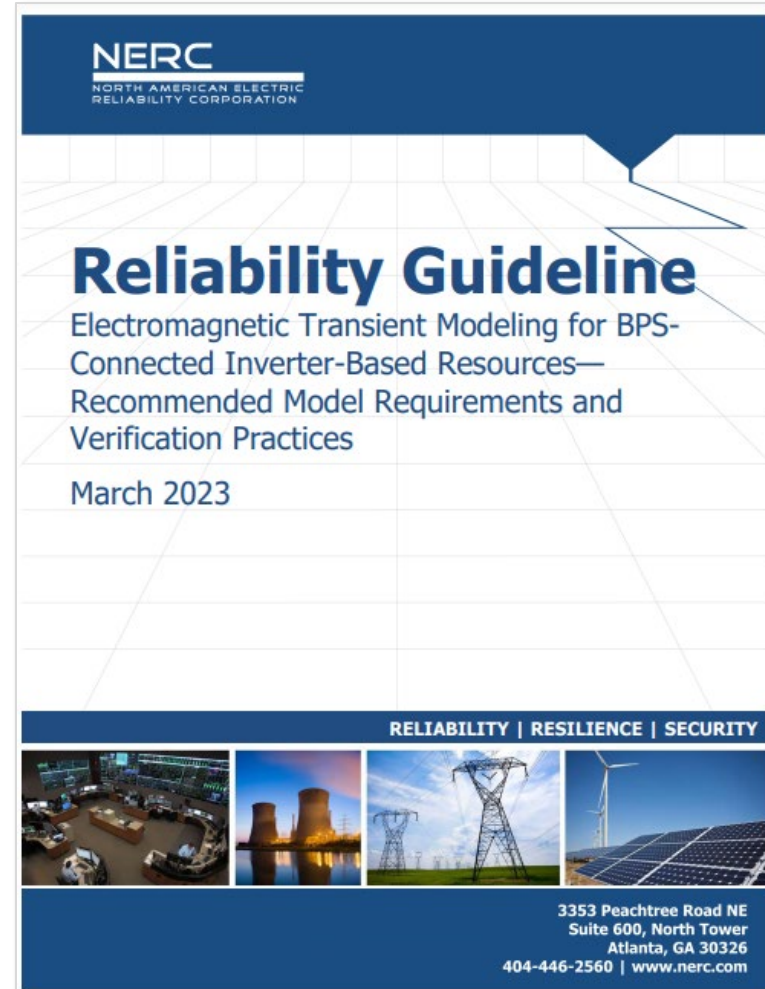
- Project 2020-02 Modifications to PRC-024 (Generator Ride-Through)
- Project 2020-06 Verification of Models and Data for Generators
- Project 2021-01 Modifications to MOD-025 and PRC-019
- Project 2021-04 Modifications to PRC-002-2
- Project 2022-04 EMT Modeling
- Project 2021-02 Modification to VAR-002
- Project 2023-01 EOP-004 IBR Event Reporting
- Project 2023-02 Performance of IBRs

- Filed work plan with FERC on February 15
 - Proposed registration criteria:
 - IBRs ≤ 75 MVA and ≥ 20 MVA connected at voltages ≥ 100 kV; or
 - IBRs ≥ 20 MVA connected at voltages > 100 kV.
 - Owners and operators included
- Conducting comprehensive standards applicability analysis
- Considering potential BES definition modifications
- ROP registration changes to Board Q1 2024

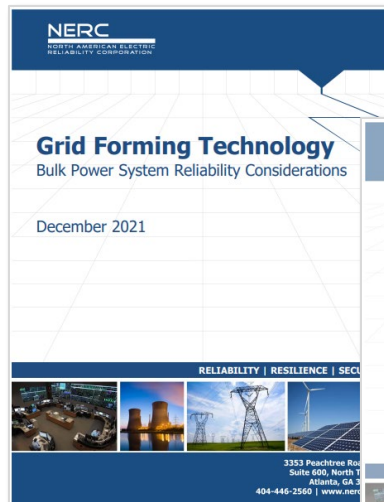
- Level 2 alert on IBR performance issues in Odessa disturbances
- Coordinating with SEIA
- Six recommendations for performance improvements
 - Coordination between Generator Owner and inverter/plant controller manufacturers
 - Inverter and plant-level protection and control issues
 - Improved ride-through performance
- Potential Level 2 alert of IBR modeling planned for Q3/4 2023

- Published recap of IBR panel at last technical session
- Developing an *IBR Basics* and *IBR Primer* documents
- Conducting a 10-part IBR webinar series in June/July
 - Kickoff webinar series targeted for industry broadly
 - Subsequent 1-hour webinars to explore NERC IBR strategy

- IBR panel highlighted growing challenge with electromagnetic transient (EMT) modeling and studies
- NERC published *EMT Modeling Reliability Guideline*
- Supports NERC standards project on EMT modeling



- Stability issues with conventional “grid following” inverter technology
- “Grid forming” inverter technology available today
- Battery energy storage systems primed to provide this capability



ofgem
Making a positive difference
for energy consumers

Modification proposal:

Grid Code (GC) GC0137: Minimum Specification Required for Provision of GB Grid Forming (GBGF) Capability (formerly Virtual Synchronous Machine (VSM) Capability) (GC0137)

Contribution of Power Electronic Power Sources and the Contribution of Grid Forming Converters
Technical Report

50hertz **amprion** **Tennet** **TRÄNSNET BW**

4-TSO Paper on Requirements for Grid-Forming Capability

Application of Advanced Grid-scale Inverters in the NEM

August 2021

White Paper

An Engineering Framework report on design capabilities needed for the future National Electricity Market

Quick Reference Guide: Inverter-Based Resource Activities

March 2023

INSIDE THIS QUICK REFERENCE GUIDE

[IBR Strategy](#) | [Disturbance Reports](#) | [Alerts](#) | [Reliability Guidelines](#) | [White Papers](#) |
[Technical Reports](#) | [Standards Activities](#) | [Other Activities](#) | [Stakeholder Groups](#)

The electric power grid in North America is undergoing a significant transformation in technology, design, control, planning, and operation, and these changes are occurring more rapidly than ever before. Particularly, technological advances in inverter-based resources are having a major impact on generation, transmission, and distribution systems.

In most cases, inverter-based generating resources refer to Type 3 and Type 4 wind power plants and solar photovoltaic (PV) resources. Battery energy storage is also considered an inverter-based resource. Many transmission-connected reactive devices, such as STATCOMs and SVCs, are also inverter-based. Similarly, HVDC circuits also interface with the ac network through converters. Inverter-based resources are being interconnected at the bulk power system (BPS) level as well as at the distribution level; however, this reference guide focuses specifically on BPS-connected inverter-based resource efforts.

This document acts as a quick reference guide for the work that the ERO Enterprise has done regarding inverter-based resource activities over the past seven years to ensure the continued reliability of the North American power grid.



Questions and Answers

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Cold Weather Standards Update

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- Background
 - Address 6 key recommendations from the Joint Inquiry Report
 - On February 16, 2023, FERC issued an order approving EOP-011-3 and EOP-012-1 and directed modifications to EOP-012-1 in five areas
 - Applicability
 - Generator constraints to implementing winterization requirements
 - Generator capability requirements
 - Corrective Action Plan deadlines
 - Implementation plan
 - September 30, 2023 deadline to address the 6 key recommendations by the Board of Trustees

- Project Updates

- Revised EOP-011-3 and TOP-002-5 to meet the phase 2 recommendations with initial ballot ending on April 13, 2023
- Team working on directives from FERC order in EOP-012-1
- Revised applicability section, new timelines for CAP and new proposed defined terms
- In-person team meeting scheduled for May 2023 with initial posting of EOP-012-2 to follow



Questions and Answers

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Level 3 Alert Essential Actions to Industry

Darrell Moore, Director

Situational Awareness and Personnel Certification & Credential Maintenance

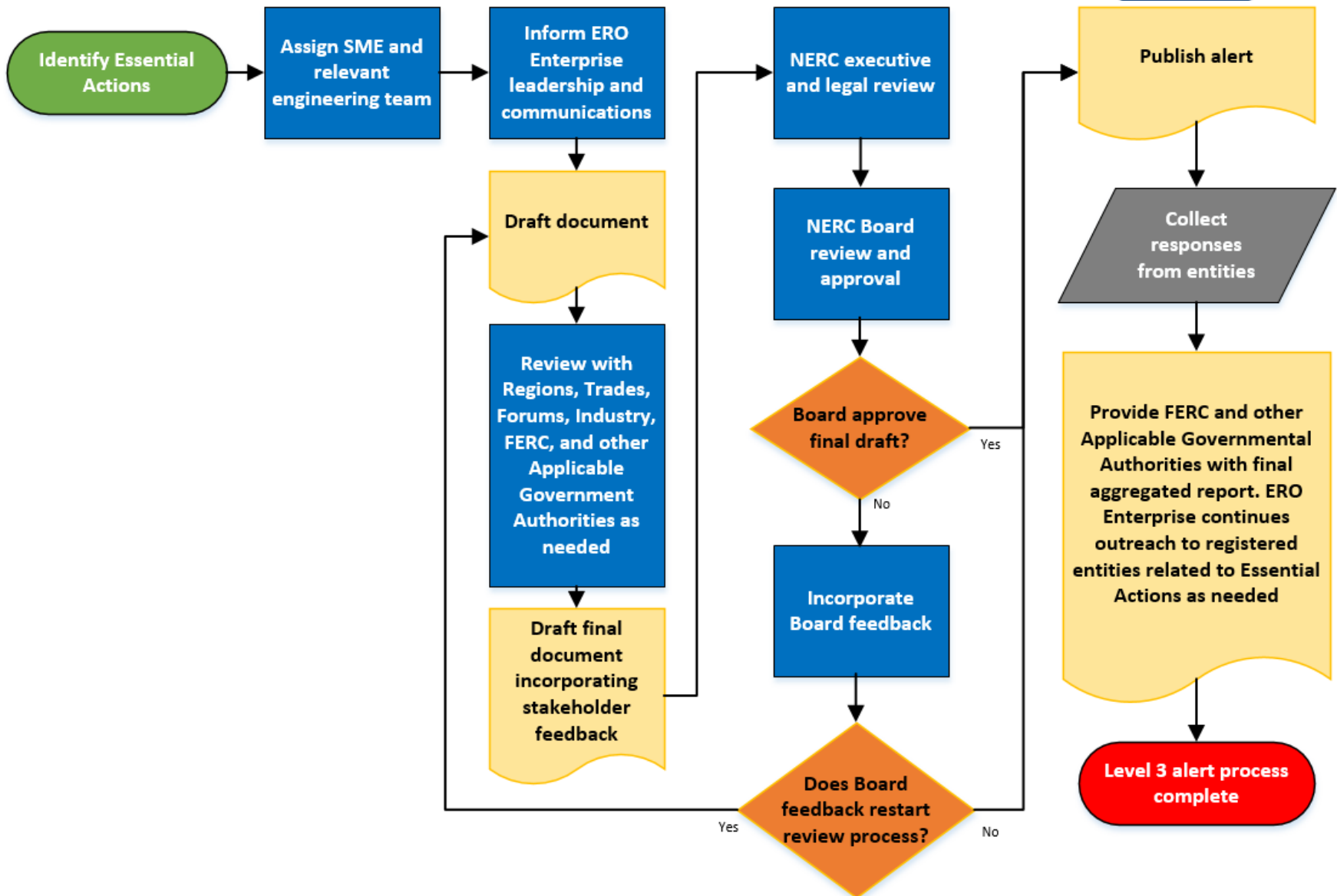
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- Given the continuing impacts on reliability, the ERO Enterprise has determined A level 3 alert Essential Actions to Industry, the highest level alert, is required for the 2023–2024 winter season and beyond.
 - Several notable events have occurred demonstrating substantial impacts that extreme cold weather conditions can have on the reliability of the Bulk Power System. Most recent being 2022 Winter Storm Elliott, 2021 Winter Storm Uri, and the 2018 South Central United States Cold Weather Event.
 - In light of these events, and the recently expedited FERC approval of Cold Weather Reliability Standards, and the recent cold weather recommendations and advisory alerts NERC published from 2021–2023, it is necessary to understand how entities are taking steps to mitigate this risk.



- Essential Actions are specific actions that NERC has determined to be essential for certain segments of owners, operators, or users of the BPS to undertake to ensure the Reliable Operation of the BPS.
- There are 8 essential actions.
- Under the ROP Board approval is required prior to issuance of a level 3 alert Essential Actions to Industry.
- This would be the first level 3 alert Essential Actions to Industry issued by NERC.
- NERC Management is seeking Board approval to issue this Level 3 Alert Essential Actions to Industry, Cold Weather Preparations for Extreme Weather Events III.



Questions and Answers

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Internal Network Security Monitoring Data Request

Howard Gugel, Vice President of Compliance Assurance and Registration
Board of Trustees Meeting
May 11, 2023

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- FERC Order 887
 - Require internal network security monitoring for all high impact Bulk Electric System (BES) Cyber Systems
 - Require internal network security monitoring for all medium impact BES Cyber Systems with External Routable Connectivity
 - Directed a study or risks for other BES Cyber Systems not covered above
 - Suggested NERC collect certain information on the number
- Board authorized expedited procedures in February
- Action
 - Authorize issuance of data request



Questions and Answers