

Agenda

Reliability and Security Technical Committee

June 9, 2022 | 10:00 a.m.–2:00 p.m. Eastern

Virtual via WebEx

Attendee WebEx Link: [Join Meeting](#)

Call to Order

NERC Antitrust Compliance Guidelines and Public Announcement*

Agenda

Introductions and Chair's Remarks

1. Electric Vehicle (EV) Charging and Potential Reliability Risks – Information – Ryan Quint/Joe Eto

Transportation electrification and EV charging are expected to be one of the largest contributors to load growth over the coming 10-20 years, and will play a key role in the transformation of the electricity ecosystem. The aggregate impacts of widespread growth of EVs across North America will have a notable effect on BPS reliability and resilience. The capabilities and operational settings of EV chargers will affect and determine grid performance and reliability in the future, and NERC is focused on working with industry across multiple forums to proactively drive grid-friendly EV performance and to better quantify future bulk power system (BPS) impacts. Updates to equipment and other industry standards are a cost-effective means for ensuring reliable operation of the BPS, and will require close collaboration between the electricity and transportation sectors. This presentation will provide an overview of current and future activities in this area.

2. 6 GHz Task Force (6GHZTF) – Information – Jennifer Flandermeyer, 6 GHzTF Chair | David Grubbs, Sponsor

In December 2021, the NERC RSTC established a task force to evaluate the issues associated with the Federal Communications Commission order that opened the 6 GHz band of radio spectrum to unlicensed users. Furthermore, the task force is charged with providing recommendations. In support of these efforts, the 6GHZTF is conducting a voluntary survey. The task force is requesting industry participation through the RSTC member companies and any additional participants from the sectors they represent. The survey purpose is the first attempt to assess penetration of 6 GHz usage or extent of condition related to BPS impacts. The results of the survey will be presented for review and discussion.

3. SPCWG Cold Weather Report Recommendation 13* – Approve – Bill Crossland, SPCWG Chair | Al Schriver, Sponsor

In early 2022, the RSTC requested that the SPCWG develop a proposal for addressing Cold Weather Recommendation 13:

Generator Owners within the ERCOT Interconnection should review the coordination of protective relay settings associated with generator underfrequency relays, balance of plant

relays, and tuning parameters associated with control systems, which could trip generating units during low frequency or high rate-of-change of frequency conditions. Also, to evaluate how often generating units trip due to these causes, NERC should consider adding a Generating Availability Data Source Cause Code Amplification Code345 for outages related to frequency deviation. (Winter 2022-2023)

The SPCWG has developed a proposed course of action and is requesting the RSTC to approve the recommendations and deliver it to the PAS for implementation.

4. EOP-004 Standard Authorization Request – Endorse – Julia Matevosyan, IRPS Vice Chair | Jody Green, Sponsor

NERC published the San Fernando disturbance report in November 2020, which identified a set of recommendations for industry. The NERC Inverter-Based Resource Performance Working Group (IRPWG) performed a follow-up analysis to identify any actions needed to address the recommendations laid out by NERC. The RSTC approved the IRPWG follow-up white paper at its June 2021 meeting. One of the recommended actions in that white paper stated: “IRPWG should draft a SAR to address the outstanding recommendation by NERC to address the issue identified in EOP-004-4 regarding the generation loss criteria so that it is applicable for inverter-based resources as well as synchronous generation.” The Inverter-based Resources Performance Subcommittee is seeking RSTC endorsement of the SAR to be submitted to the NERC Standards Committee.

5. ERO and RSTC Strategic Plan Alignment – Information – Mark Lauby/Rich Hydzik

The RSTC is a stakeholder committee chartered by the NERC Board of Trustees (Board) to proactively support the NERC Enterprise mission. The RSTC, in accordance with its charter, will develop and maintain a two-year strategic plan and an associated Work Plan to carry-out the functions of the committee:

- Ensure alignment of the strategic work plan with ERO reports and analyses, including the NERC Business Plan and Budget, ERO Enterprise Long-Term Strategy, biennial Reliability Issues Steering Committee (RISC) ERO Reliability Risk Priorities report, State of Reliability report recommendations, Long Term, Seasonal and Special Reliability Assessment recommendations and ongoing event analysis trends;
- Coordinate the objectives in the strategic work plan with the Standing Committees Coordinating Group; and,
- Obtain annual NERC Board approval.

6. E-ISAC Cyber Threat Landscape Brief – Information – Matt Duncan, E-ISAC

E-ISAC management will provide an update on the latest information on cyber and physical threats from the E-ISAC.

7. RAS LTRA Preview and 2022 Assessment Plan – Information – John Moura, NERC Staff

NERC develops long-term and seasonal reliability assessments in accordance with the Electric Reliability Organization’s (ERO) Rules of Procedure and Section 215 of the Federal Power Act. The reliability assessment process is a coordinated reliability evaluation between the Reliability Assessment Subcommittee (RAS), the Probabilistic Assessment Working Group (PAWG) that reports to RAS, the Regional Entities, and NERC staff. The RSTC will receive an update on plans for the 2022 Long-Term Reliability Assessment (including probabilistic assessment) and the 2022-23 Winter Reliability Assessment (WRA).

8. WECC-NERC Joint Report: Assessment of High Penetration and Ramping of Variable Energy Resources – Information – Rich Bauer, NERC Staff

In September 2020 FERC held discussions with NERC and WECC in response to the load shed event(s) that occurred on August 14-15, 2020, in the CAISO area. FERC requested that NERC and WECC perform analysis that looks closely at the transition periods of high levels of renewable resource availability followed by low levels of renewable resource availability. (i.e., the evening ramp off of solar resources.) FERC staff encouraged NERC and WECC to think broadly about recommendations and to consider whether fundamental changes need to occur such as changes to reliability standards, development of planning criteria, or other such recommendations to address any operational risks identified.

9. Forum and Group Reports – Information

- a. North American Generator Forum* – Wayne Sipperly
- b. North American Transmission Forum* – Roman Carter

10. RSTC 2022-2023 Calendar Review – Stephen Crutchfield

2022-2023 Meeting Dates	Time	Location	Hotel
September 13, 2022 September 14, 2022	Please reserve entirety of both days	Atlanta	Grand Hyatt Buckhead
December 6, 2022 December 7, 2022	Please reserve entirety of both days	Virtual	Virtual
March 8, 2023 March 9, 2023	Please reserve entirety of both days	TBD	TBD
June 14 2023 June 15, 2023	Please reserve entirety of both days	TBD	TBD
September 13, 2023 September 14, 2023	Please reserve entirety of both days	TBD	TBD
December 6, 2023 December 7, 2023	Please reserve entirety of both days	TBD	TBD

11. Chair’s Closing Remarks and Adjournment

*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.

RSTC Meetings – Governance Management

Chair will state the governance management of the meeting as follows:

1. For each topic, the Chair will introduce the topic and allow for discussion.
2. At the conclusion of the discussion, the Chair will state the primary motion, and ask for first/second.
3. The Chair will then call for any additional discussion.
 - During such discussion, a secondary motion can be offered,
 - The Chair will ask for first/second, discussion/debate; the Chair will then call for a vote.
 - If the secondary motion does not receive a second or is voted down, the Chair will go back and restate the primary motion.
4. At this point, the following actions may proceed:
 - Debate on that primary motion again;
 - Another secondary motion can be offered;
 - Motion could be offered to postpone, table, etc. Management of next action will follow Steps 3 and 4.

The Chair is able to initiate a motion to end a debate.

Motions can encompass accepting minor revisions as provided during the discussions and reflected in the words of the motion.

Guiding principle is one thing at a time.

Reliability & Security Guidelines

- Formulated from best and/or optimal practices
- Suggested approaches or behaviors
- “HOW” certain objectives can be met
- Recommendations for how objectives “could” or “should” be accomplished

Reference Documents, Whitepapers and Technical Reports

- Documented technical concepts
- Definitions of technical terms
- Defined methods or approaches
- Can be used as justification to support “WHY” certain practices are needed

Implementation Guidance

- Provides examples or approaches for “HOW” Registered Entities could demonstrate compliance with Reliability Standard requirements.
- Used in Compliance Monitoring and Enforcement activities

Submitted to ERO

Standard Authorization Request

- Defines scope, reliability benefit, and technical justification for a new or modified Reliability Standard or definition.
- Identifies “WHAT” requirements are needed to ensure the reliable operation of the BPS

Submitted to SC

Reliability Assessment Reports

- Independent and objective evaluations of BPS reliability conducted by the ERO
- Subgroup used to gain industry perspectives, expertise, and validation
- Requires BOT approval

Reliability & Security Guidelines

- **ACCEPT** for public comment
 - Is guidance needed on this topic?
 - Are there major flaws?
- **APPROVE**
 - Has the public and committee comments been sufficiently addressed?
 - Do you agree with the recommended guidance?

Reference Documents, Whitepapers and Technical Reports

- **APPROVE**
 - Does it provide sufficient detail to support technical, security, and engineering SMEs?
 - Has it been peer reviewed and supported by a technical subgroup?
 - Is it foundational and/or conceptual
 - Does it contain specific recommendations?

Implementation Guidance

- **ENDORSE**
 - Does it provide examples or approaches on how to implement a Reliability Standard?
 - Does it meet the expectations identified in the Implementation Guidance Development and Review Aid?

Standard Authorization Request

- **ENDORSE**
 - Is the SAR form complete?
 - Does it contain technical justification?

Reliability Assessment Reports

- **ENDORSE**
 - Is there general agreement with findings and recommendations?
 - Was the process followed?

- **Approve:** The RSTC has reviewed the deliverable and supports the content and development process, including any recommendations.
- **Accept:** The RSTC has reviewed the deliverable and supports the development process used to complete the deliverable.
- **Remand:** The RSTC remands the deliverable to the originating subcommittee, refer it to another group, or direct other action by the RSTC or one of its subcommittees or groups.
- **Endorse:** The RSTC agrees with the content of the document or action, and recommends the deliverable for the approving authority to act on. This includes deliverables that are provided to the RSTC by other NERC committees. RSTC endorsements will be made with recognition that the deliverable is subject to further modifications by NERC Executive Management and/or the NERC Board. Changes made to the deliverable subsequent to RSTC endorsement will be presented to the RSTC in a timely manner. If the RSTC does not agree with the deliverable or its recommendations, it may decline endorsement. It is recognized that this does not prevent an approval authority from further action.

Electric Vehicle (EV) Charging and Potential Reliability Risks

Action

Information

Summary

Transportation electrification and EV charging are expected to be one of the largest contributors to load growth over the coming 10-20 years, and will play a key role in the transformation of the electricity ecosystem. The aggregate impacts of widespread growth of EVs across North America will have a notable effect on BPS reliability and resilience. The capabilities and operational settings of EV chargers will affect and determine grid performance and reliability in the future, and NERC is focused on working with industry across multiple forums to proactively drive grid-friendly EV performance and to better quantify future bulk power system (BPS) impacts. Updates to equipment and other industry standards are a cost-effective means for ensuring reliable operation of the BPS, and will require close collaboration between the electricity and transportation sectors. This presentation will provide an overview of current and future activities in this area.

6 GHz Task Force (6GHZTF)

Action

Information

Summary

In December 2021, the NERC RSTC established a task force to evaluate the issues associated with the Federal Communications Commission order that opened the 6 GHz band of radio spectrum to unlicensed users. Furthermore, the task force is charged with providing recommendations. In support of these efforts, the 6GHZTF is conducting a voluntary survey. The task force is requesting industry participation through the RSTC member companies and any additional participants from the sectors they represent. The survey purpose is the first attempt to assess penetration of 6 GHz usage or extent of condition related to BPS impacts. The results of the survey will be presented for review and discussion.

SPCWG Cold Weather Report Recommendation 13

Action

Approve

Summary

In early 2022, the RSTC requested that the SPCWG develop a proposal for addressing Cold Weather Recommendation 13:

Generator Owners within the ERCOT Interconnection should review the coordination of protective relay settings associated with generator underfrequency relays, balance of plant relays, and tuning parameters associated with control systems, which could trip generating units during low frequency or high rate-of-change of frequency conditions. Also, to evaluate how often generating units trip due to these causes, NERC should consider adding a Generating Availability Data Source Cause Code Amplification Code345 for outages related to frequency deviation. (Winter 2022-2023)

The SPCWG has developed a proposed course of action and is requesting the RSTC to approve the recommendations and deliver it to the PAS for implementation.

EOP-004-4 Standard

Action

Endorse

Reference Material

Standard Authorization Request (SAR): EOP-004-4 Event Reporting

Supporting Paper: San Fernando Disturbance Follow-Up

Background

As reported in numerous ERO disturbance reports, access to data useful for event analysis and risk mitigation following large-scale disturbances has been challenging for inverter-based resources. This has resulted in data unavailability and overwriting by affected facilities since the ERO Enterprise is unable to send requests for information (RFIs) in a timely manner (i.e., must wait for the brief report to be submitted by the associated Reliability Coordinator first). The proposed SAR would address the issue that reporting of generation loss events per the current EOP-004-4 uses relatively large size thresholds more suitable for synchronous generation; however, NERC and the Regional Entities have analyzed multiple widespread solar PV loss events (some also involving other generation losses as well) across a large number of resources that did not meet the EOP-004 criteria yet have highlighted systemic reliability risks posed by inverter-based resources that should be reported by applicable entities. This project proposes that a standard drafting team (SDT) modify the existing generation loss criteria so it is more suitable and appropriate for reporting inverter-based resource events and so it aligns with past large-scale disturbances analyzed by the Electric Reliability Organization (ERO). Without these improvements, the ERO must lean on ad hoc reporting per the NERC Event Analysis Process, which is voluntary in nature and involves significantly longer reporting timelines. The SAR recommends aligning the EOP-004 standard from a reporting size criteria perspective. Improved reporting would enable quicker response to widespread inverter-based resource loss events and is expected to ultimately lead to improved performance of the generation fleet through more detailed analysis and coordination with affected entities, where applicable.

Standard Authorization Request Vetting Process

The San Fernando Disturbance Follow-Up white paper was developed by the NERC Inverter-Based Resource Performance Working Group (IRPWG) as a follow-up to the July 2020 San Fernando Disturbance Report published by NERC. That report contained a set of key findings and recommendations. The IRPWG discussed each of the key findings and recommendations in detail, provided a brief technical discussion and basis for each item in the white paper, and where appropriate recommended follow-up action items. The white paper contained recommendations from the NERC disturbance report, a technical discussion by the IRPS and the recommendation to address the report recommendation. The white paper was reviewed, discussed and approved at the June 2021 RSTC meeting.

The following recommendation is copied from the San Fernando Disturbance Report:

Recommendation (Industry, NERC, FERC): Ad hoc reporting of events involving multiple generating resources and possible systemic performance issues should not be considered an acceptable level of reporting. NERC EOP-004-4 should be reviewed in terms of the thresholds used for generator tripping events and should also consider the extent of resources involved in the disturbance. A reasonable threshold for reporting would be around 500 MW of reduction in output (partial or full tripping across all affected resources). Updates to reporting these types of events (not necessarily with quick turnaround times) will help industry improve their situational awareness of abnormal inverter-based resource performance and possible issues needing mitigating action by facility owners to improve their performance.

The IRPWG white paper regarding the San Fernando disturbance follow-up stated the following:

Follow-Up: There is no known action to develop a SAR to address the issues raised by NERC regarding EOP-004-4 and the generation loss requirement it includes. Without addressing this issue, these types of events will not be reported on any uniform basis and will continue to be ad hoc in terms of initiating an analysis. BA and RC reporting helps ensure that the ERO Enterprise is apprised of widespread events and coordinated analyses can occur to support industry address possible reliability risks. NERC Event Analysis Process now includes Category 1i to capture the “non-consequential interruption of inverter type resources aggregated to 500 MW or more not caused by a fault on its inverters, or its ac terminal equipment.” The ERO Enterprise will continue to analyze these types of disturbances to identify any possible systemic causes of inverter tripping.

Recommended Action from IRPWG Follow-Up: IRPWG should draft a SAR to address the outstanding recommendation by NERC to address the issue identified in EOP-004-4 regarding the generation loss criteria so that it is applicable for inverter-based resources as well synchronous generation.

Timely reporting and analysis of affected inverter-based resource facilities for widespread loss or reduction of their output is critical for understanding the changing resource mix and for supporting the reliable operation of these new resources. Post-mortem event analysis enables entities to learn about any abnormalities in their performance (which then can be assessed with their provided models for reliability studies) and develop corrective actions to address those issues. NERC and the Regional Entities continue to support industry in identifying possible systemic reliability issues, work with affected entities to develop corrections, and coordinate with equipment manufacturers to identify possible improvements to existing equipment and equipment being newly released to market.

Summary

This purpose of this SAR is to propose Reliability Standards modifications that would revise Attachment 1 of EOP-004-4 to ensure that generation loss events impacting many resources (and across multiple BA or RC footprints) are included in event reporting. This has been highlighted in multiple ERO disturbance reports, and has included inverter-based resources as

well as synchronous generation. EOP-004-4 does not presently include any event categorization of this nature since it focuses solely on a large generation loss criteria more suitable for forced outages of large synchronous generating resources. The proposed revisions to EOP-004-4 would help align mandatory event reporting with the updated NERC Event Analysis Categorized Events and will ensure that events involving a widespread reduction or loss of inverter-based generation is reported appropriately.

Upon endorsement, the SARs would go through the standards development process under Appendix 3A of the NERC Rules of Procedure. The immediate next step would be a request that the Standards Committee accept the SARs for development by a standard drafting team.

Standard Authorization Request (SAR)

Complete and submit this form, with attachment(s) to the [NERC Help Desk](#). Upon entering the Captcha, please type in your contact information, and attach the SAR to your ticket. Once submitted, you will receive a confirmation number which you can use to track your request.

The North American Electric Reliability Corporation (NERC) welcomes suggestions to improve the reliability of the bulk power system through improved Reliability Standards.

Requested information			
SAR Title:	EOP-004-4 Event Reporting		
Date Submitted:	7/2022		
SAR Requester			
Name:	Allen Schriver, NextEra Energy (NERC IRPS Chair) Julia Matevosyan, ESIG (NERC IRPS Vice Chair)		
Organization:	NERC Inverter-Based Resource Performance Subcommittee (IRPS)		
Telephone:	Allen – 561-904-3234 Julia – 512-994-7914	Email:	allen.schriver@fpl.com julia@esig.energy
SAR Type (Check as many as apply)			
<input type="checkbox"/>	New Standard	<input type="checkbox"/>	Imminent Action/ Confidential Issue (SPM Section 10)
<input checked="" type="checkbox"/>	Revision to Existing Standard	<input type="checkbox"/>	Variance development or revision
<input type="checkbox"/>	Add, Modify or Retire a Glossary Term	<input type="checkbox"/>	Other (Please specify)
<input type="checkbox"/>	Withdraw/retire an Existing Standard		
Justification for this proposed standard development project (Check all that apply to help NERC prioritize development)			
<input type="checkbox"/>	Regulatory Initiation	<input checked="" type="checkbox"/>	NERC Standing Committee Identified
<input type="checkbox"/>	Emerging Risk (Reliability Issues Steering Committee) Identified	<input type="checkbox"/>	Enhanced Periodic Review Initiated
<input type="checkbox"/>	Reliability Standard Development Plan	<input checked="" type="checkbox"/>	Industry Stakeholder Identified
Industry Need (What Bulk Electric System (BES) reliability benefit does the proposed project provide?):			
<p>NERC published the San Fernando disturbance report¹ in November 2020, which identified a set of recommendations for industry. The NERC Inverter-Based Resource Performance Working Group (IRPWG) performed a follow-up analysis to identify any actions needed to address the recommendations laid out by NERC. The NERC Reliability and Security Technical Committee (RSTC) approved² the IRPWG follow-up white paper³ at its June 2021 meeting. One of the recommended action in that white paper stated: “IRPWG should draft a SAR to address the outstanding recommendation by NERC to address the issue identified in EOP-004-4⁴ regarding the generation loss criteria so that it is applicable for inverter-based resources as well as synchronous generation.”</p>			

¹ https://www.nerc.com/pa/rrm/ea/Documents/San_Fernando_Disturbance_Report.pdf

² https://www.nerc.com/comm/RSTC/AgendaHighlightsandMinutes/RSTC_Day_1_June_8_2021_Agenda_Package_ATTENDEE_ONLY.pdf

³ <https://www.nerc.com/comm/RSTC/IRPWG/IRPWG%20San%20Fernando%20Disturbance%20Follow-Up%20Paper.pdf>

⁴ <https://www.nerc.com/pa/Stand/Reliability%20Standards/EOP-004-4.pdf>

Requested information

The proposed project will address the issue that reporting of generation loss events per the current EOP-004-4 uses relatively large size thresholds more suitable for synchronous generation; however, NERC and the Regional Entities have analyzed multiple widespread solar PV loss events (some also involving other generation losses as well) across a large number of resources that did not meet the EOP-004 criteria yet have highlighted systemic reliability risks posed by inverter-based resources that should be reported by applicable entities. This project will modify the existing generation loss criteria so it is more suitable and appropriate for reporting inverter-based resource events and so it aligns with past large-scale disturbances analyzed by the Electric Reliability Organization (ERO). Without these improvements, the ERO must lean on ad hoc reporting per the NERC Event Analysis Process, which is voluntary in nature and involves significantly longer reporting timelines. The EOP-004 standard should be aligned with this process from a reporting size criteria perspective. As reported in numerous ERO disturbance reports, access to data useful for event analysis and risk mitigation following large-scale disturbances has been challenging for inverter-based resources. This has resulted in data unavailability and overwriting by affected facilities since the ERO Enterprise is unable to send requests for information (RFIs) in a timely manner (i.e., must wait for the brief report to be submitted by the associated Reliability Coordinator first). Improved reporting will enable quicker response to widespread inverter-based resource loss events and ultimately lead to improved performance of the generation fleet through more detailed analysis and coordination with affected entities, where applicable.

Purpose or Goal (How does this proposed project provide the reliability-related benefit described above?):

This purpose of this SAR is to revise Attachment 1 of EOP-004-4 to ensure that generation loss events impacting many resources (and across multiple BA or RC footprints) are included in event reporting. This has been highlighted in multiple ERO disturbance reports, and has included inverter-based resources as well as synchronous generation. EOP-004-4 does not presently include any event categorization of this nature since it focuses solely on a large generation loss criteria more suitable for forced outages of large synchronous generating resources. The proposed revisions to EOP-004-4 will help align mandatory event reporting with the updated NERC Event Analysis Categorized Events⁵ and will ensure that events involving a widespread reduction or loss of inverter-based generation is reported appropriately.

Project Scope (Define the parameters of the proposed project):

As described in detail below, the scope of this project includes the following revisions to EOP-004-4:

- Modify Attachment 1 to either revise the “Generation loss” row to be inclusive for inverter-based resources or add an additional row related to inverter-based resource loss events and clarify the existing row.
- Provide any necessary clarity around reporting “loss” events for inverter-based resources that account for the differences in their performance compared with synchronous generation (e.g.,

⁵ https://www.nerc.com/pa/rrm/ea/ERO_EAP_Documents%20DL/ERO_EAP_v4.0_final.pdf

Requested information

momentary cessation, delayed power recovery, unexpected ramp rate interactions, and other factors that affect the overall resource loss value).

- Ensure that future events similar to past widespread loss of solar PV events analyzed by NERC would be captured by the event reporting thresholds specified in EOP-004-4.
- Consider whether number of affected facilities or resources should be a criteria for reporting, in addition to MW threshold values. Many affected facilities responding to BPS faults in an abnormal manner could pose risks to BPS reliability.
- Ensure that the criteria for reporting in Attachment 1 is inclusive of both Category 1i and Category 1j events in the NERC Event Analysis Process.
- Consider adding the Reliability Coordinator (RC) to the “Entity with Reporting Responsibility” column for inverter-based loss events since the RC can provide a wide-area view, coordinate with neighboring RCs for events that cross RC boundaries, and is often involved in the analysis of these types of events.

-Detailed Description (Describe the proposed deliverable(s) with sufficient detail for a drafting team to execute the project. If you propose a new or substantially revised Reliability Standard or definition, provide: (1) a technical justification⁶ which includes a discussion of the reliability-related benefits of developing a new or revised Reliability Standard or definition, and (2) a technical foundation document (e.g., research paper) to guide development of the Standard or definition):

The *Background and Technical Basis* of this SAR (see attachment at end of document) provides key references from ERO disturbance reports highlighting the challenges of conducting adequate event analysis. This SAR is proposing to align the NERC Event Analysis Process reporting for Category 1i events with the reporting requirements in EOP-004 so that the ERO Enterprise is notified of widespread inverter-based resource loss events in a timely manner. This will facilitate more effective and efficient event analysis involving these resources, which will then help improve reliability and operational performance of the inverter-based resource fleet. The ERO Enterprise continues to observe and analyze widespread inverter-based resource loss events that include solar photovoltaic (PV), wind, battery energy storage, and hybrid plants. These events have also included additional loss of synchronous generating resources in addition to the inverter-based resources. It is important that these types of events are reported in a timely manner.

The proposed project seeks to modify Attachment 1 related to “Generation loss” events. Currently the loss thresholds are quite large, focused primarily on loss of large synchronous generation resources and does not capture widespread loss of many smaller resources such as those observed by the ERO Enterprise related to inverter-based resources.

It may be necessary to more clearly define what “loss” events are for inverter-based resources since the reduction of power output from these resources may not simply reflect the opening of a circuit breaker. This has been documented in many ERO disturbance reports and guidelines. Reductions

⁶ The NERC Rules of Procedure require a technical justification for new or substantially revised Reliability Standards. Please attach pertinent information to this form before submittal to NERC.

Requested information

that involve the protections and controls from the power electronics of inverter-based resources should be included in the “loss” accounting, and should not solely focus on opening of ac circuit breakers. This may need to be clarified and noted in the EOP-004 standard. The standard drafting team can leverage the work done by the NERC Event Analysis Process to articulate the Category 1i loss events.

This SAR also proposes that the standard drafting team also consider whether number of affected facilities should be a threshold for reporting, in addition to the size of the reduction. Number of affected facilities may be a useful indicator of possible systemic reliability issues and may provide faint signals to larger reliability issues that could occur in the future if not mitigated.

Lastly, this SAR proposes including the RC as an entity with reporting responsibility since they are best suited for identifying widespread events such as those that have occurred involving solar PV and wind resources. RCs are also able to coordinate with their neighboring RCs in an effective manner to identify if the loss of resources spans across multiple footprints.

Cost Impact Assessment, if known (Provide a paragraph describing the potential cost impacts associated with the proposed project):

The cost impacts for the proposed changes to EOP-004 are likely minimal. The changes being proposed focus solely on reporting of large-scale disturbance events, which are critical for reliability but are relatively rare. These entities already provide reporting for other types of events. Reporting frequency may increase slightly; however, the impact is expected to be minimal.

Please describe any unique characteristics of the BES facilities that may be impacted by this proposed standard development project (e.g., Dispersed Generation Resources):

None. This SAR will impact Balancing Authorities and Reliability Coordinators.

To assist the NERC Standards Committee in appointing a drafting team with the appropriate members, please indicate to which Functional Entities the proposed standard(s) should apply (e.g., Transmission Operator, Reliability Coordinator, etc. See the most recent version of the NERC Functional Model for definitions):

Balancing Authorities, Reliability Coordinators, Transmission Operators, Generator Owners, Generator Operators

Do you know of any consensus building activities⁷ in connection with this SAR? If so, please provide any recommendations or findings resulting from the consensus building activity.

This SAR is an outcome of the recommendations set forth in the white paper produced by the NERC IRPWG and approved by the NERC RSTC regarding the San Fernando Disturbance Report Follow-Up:

⁷ Consensus building activities are occasionally conducted by NERC and/or project review teams. They typically are conducted to obtain industry inputs prior to proposing any standard development project to revise, or develop a standard or definition.

Requested information

<https://www.nerc.com/comm/RSTC/IRPWG/IRPWG%20San%20Fernando%20Disturbance%20Follow-Up%20Paper.pdf>

Are there any related standards or SARs that should be assessed for impact as a result of this proposed project? If so, which standard(s) or project number(s)?

No

Are there alternatives (e.g., guidelines, white paper, alerts, etc.) that have been considered or could meet the objectives? If so, please list the alternatives.

The NERC IRPWG has published many reports, white papers, and reliability guidelines related to the performance, modeling, and studies of BPS-connected inverter-based resources. These technical materials are used widely by industry and have provided significant value for improving planning practices. However, those efforts cannot ensure that widespread resource loss events related to inverter-based resources are reported to the ERO per EOP-004-4.

Reliability Principles

Does this proposed standard development project support at least one of the following Reliability Principles ([Reliability Interface Principles](#))? Please check all those that apply.

<input checked="" type="checkbox"/>	1. Interconnected bulk power systems shall be planned and operated in a coordinated manner to perform reliably under normal and abnormal conditions as defined in the NERC Standards.
<input type="checkbox"/>	2. The frequency and voltage of interconnected bulk power systems shall be controlled within defined limits through the balancing of real and reactive power supply and demand.
<input checked="" type="checkbox"/>	3. Information necessary for the planning and operation of interconnected bulk power systems shall be made available to those entities responsible for planning and operating the systems reliably.
<input type="checkbox"/>	4. Plans for emergency operation and system restoration of interconnected bulk power systems shall be developed, coordinated, maintained and implemented.
<input type="checkbox"/>	5. Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk power systems.
<input type="checkbox"/>	6. Personnel responsible for planning and operating interconnected bulk power systems shall be trained, qualified, and have the responsibility and authority to implement actions.
<input type="checkbox"/>	7. The security of the interconnected bulk power systems shall be assessed, monitored and maintained on a wide area basis.
<input type="checkbox"/>	8. Bulk power systems shall be protected from malicious physical or cyber attacks.

Market Interface Principles

Does the proposed standard development project comply with all of the following Market Interface Principles ?	Enter (yes/no)
1. A reliability standard shall not give any market participant an unfair competitive advantage.	Yes

Market Interface Principles	
2. A reliability standard shall neither mandate nor prohibit any specific market structure.	Yes
3. A reliability standard shall not preclude market solutions to achieving compliance with that standard.	Yes
4. A reliability standard shall not require the public disclosure of commercially sensitive information. All market participants shall have equal opportunity to access commercially non-sensitive information that is required for compliance with reliability standards.	Yes

Identified Existing or Potential Regional or Interconnection Variances	
Region(s)/ Interconnection	Explanation
None	None

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SAR Status Tracking (Check off as appropriate).	
<input type="checkbox"/> Draft SAR reviewed by NERC Staff <input type="checkbox"/> Draft SAR presented to SC for acceptance <input type="checkbox"/> DRAFT SAR approved for posting by the SC	<input type="checkbox"/> Final SAR endorsed by the SC <input type="checkbox"/> SAR assigned a Standards Project by NERC <input type="checkbox"/> SAR denied or proposed as Guidance document

Version History

Version	Date	Owner	Change Tracking
1	June 3, 2013		Revised
1	August 29, 2014	Standards Information Staff	Updated template
2	January 18, 2017	Standards Information Staff	Revised
2	June 28, 2017	Standards Information Staff	Updated template
3	February 22, 2019	Standards Information Staff	Added instructions to submit via Help Desk
4	February 25, 2020	Standards Information Staff	Updated template footer

Background and Technical Basis

The following recommendation is copied from the San Fernando Disturbance Report:

Recommendation (Industry, NERC, FERC): Ad hoc reporting of events involving multiple generating resources and possible systemic performance issues should not be considered an acceptable level of reporting. NERC EOP-004-4 should be reviewed in terms of the thresholds used for generator tripping events and should also consider the extent of resources involved in the disturbance. A reasonable threshold for reporting would be around 500 MW of reduction in output (partial or full tripping across all affected resources). Updates to reporting these types of events (not necessarily with quick turnaround times) will help industry improve their situational awareness of abnormal inverter-based resource performance and possible issues needing mitigating action by facility owners to improve their performance.

The IRPWG white paper regarding the San Fernando disturbance follow-up stated the following:

Follow-Up: There is no known action to develop a SAR to address the issues raised by NERC regarding EOP-004-4 and the generation loss requirement it includes. Without addressing this issue, these types of events will not be reported on any uniform basis and will continue to be ad hoc in terms of initiating an analysis. BA and RC reporting helps ensure that the ERO Enterprise is apprised of widespread events and coordinated analyses can occur to support industry address possible reliability risks. NERC Event Analysis Process now includes Category 1i to capture the “non-consequential interruption of inverter type resources aggregated to 500 MW or more not caused by a fault on its inverters, or its ac terminal equipment.” The ERO Enterprise will continue to analyze these types of disturbances to identify any possible systemic causes of inverter tripping.

Recommended Action from IRPWG Follow-Up: IRPWG should draft a SAR to address the outstanding recommendation by NERC to address the issue identified in EOP-004-4 regarding the generation loss criteria so that it is applicable for inverter-based resources as well synchronous generation.

Timely reporting and analysis of affected inverter-based resource facilities for widespread loss or reduction of their output is critical for understanding the changing resource mix and for supporting the reliable operation of these new resources. Post-mortem event analysis enables entities to learn about any abnormalities in their performance (which then can be assessed with their provided models for reliability studies) and develop corrective actions to address those issues. NERC and the Regional Entities continue to support industry in identifying possible systemic reliability issues, work with affected entities to develop corrections, and coordinate with equipment manufacturers to identify possible improvements to existing equipment and equipment being newly released to market.

ERO and RSTC Strategic Plan Alignment

Action

Information

Background

The Reliability and Security Technical Committee (RSTC) is a stakeholder committee chartered by the NERC Board of Trustees (Board) to proactively support the NERC Enterprise mission. The RSTC, in accordance with its charter, will develop and maintain a two-year strategic plan and an associated Work Plan to carry-out the functions of the committee:

- Ensure alignment of the strategic work plan with ERO reports and analyses, including the NERC Business Plan and Budget, ERO Enterprise Long-Term Strategy, biennial Reliability Issues Steering Committee (RISC) ERO Reliability Risk Priorities report, State of Reliability report recommendations, Long Term, Seasonal and Special Reliability Assessment recommendations and ongoing event analysis trends;
- Coordinate the objectives in the strategic work plan with the Standing Committees Coordinating Group; and,
- Obtain annual NERC Board approval.

E-ISAC Cyber Threat Landscape Brief

Action

Information

Summary

E-ISAC management will provide an update on the current cyber and physical security landscape.

RAS LTRA Preview and 2022 Assessment Plan

Action

Information

Summary

NERC develops long-term and seasonal reliability assessments in accordance with the Electric Reliability Organization's (ERO) Rules of Procedure and Section 215 of the Federal Power Act. The reliability assessment process is a coordinated reliability evaluation between the Reliability Assessment Subcommittee (RAS), the Probabilistic Assessment Working Group (PAWG) that reports to RAS, the Regional Entities, and NERC staff. The RSTC will receive an update on plans for the 2022 Long-Term Reliability Assessment (including probabilistic assessment) and the 2022-23 Winter Reliability Assessment (WRA).

**WECC-NERC Joint Report: Assessment of High Penetration and
Ramping of Variable Energy Resources**

Action

Information

Summary

In September 2020 FERC held discussions with NERC and WECC in response to the load shed event(s) that occurred on August 14-15, 2020, in the CAISO area. FERC requested that NERC and WECC perform analysis that looks closely at the transition periods of high levels of renewable resource availability followed by low levels of renewable resource availability. (i.e., the evening ramp off of solar resources.) FERC staff encouraged NERC and WECC to think broadly about recommendations and to consider whether fundamental changes need to occur such as changes to reliability standards, development of planning criteria, or other such recommendations to address any operational risks identified.

To: NERC Reliability and Security Technical Committee (RSTC)
From: Roman Carter, Director – Peer Reviews, Assistance, Training & Knowledge Management
Date: May 9, 2022
Subject: NATF Periodic Report to the NERC RSTC (June 2022)
Attachments: NATF External Newsletter (April 2022)

The NATF interfaces with the industry as well as regulatory agencies on key reliability, resiliency, security, and safety topics to promote collaboration, alignment, and continuous improvement, while reducing duplication of effort. Some examples are highlighted below and in the attached NATF External Newsletter, which is also available on our public website: www.natf.net/news/newsletters.

NATF Supply Chain Risk Management Activities

The NATF's diligent efforts towards supply chain improvement and industry coordination continue to yield positive results. The ERO endorsement provides registered entities confidence that using the security approach provided in the NATF model is one way to meet regulatory requirements. The endorsement will also support our efforts to promote convergence on the approach in the NATF model. NATF staff and members recently reviewed industry comments on suggested enhancements. It is expected the NATF will publicly post the updated documents in late June.

NATF-ERO Leadership Meetings

NATF and ERO leadership meet periodically to discuss collaborative work and industry topics. The most-recent call, on April 22, included discussions on security (E-ISAC), supply chain, facility ratings, NERC business strategy plan, climate scenario development, energy reliability assessment status, and the spring 2023 resilience summit.

FERC Order 881 (Ambient-Adjusted Ratings)

The NATF has initiated an effort to work with members towards implementation of FERC Order 881 ("Managing Transmission Line Ratings"), which is an important order for transmission. Elements include webinars and a diverse group of subject-matter experts to discuss challenges and identify potential work on best practices.

Human Performance

The NATF has been advancing member work in human performance for many years via our Practices program and operating experience activities (e.g., information sharing, best practices, and member workshops). We have also previously worked with NERC on joint human performance symposiums. We understand NERC is scaling back work in this area but wanted to assure you the NATF and its members will remain focused on human-performance tools and improvement.

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North American Transmission Forum External Newsletter

April 2022

ERO Enterprise Endorses NATF Implementation Guidance for CIP-013

On February 28, the [ERO Enterprise endorsed](#) two NATF Implementation Guidance documents, further signaling the ERO Enterprise's support of the [NATF supply chain security model, criteria, and questionnaire](#). The endorsement provides entities confidence that using the security approach provided in the NATF model is one way to meet regulatory requirements. Obtaining the ERO endorsement is a major step forward for encouraging further adoption of these tools, and supports industry convergence and streamlined supply chain risk management.

About the Documents

"NATF CIP-013 Implementation Guidance: Using Independent Assessments of Vendors"

This guidance describes one way a Responsible Entity may meet the obligations in Requirements R1 and R2 when relying upon a qualified independent assessment of suppliers' security practices. It is an update to the existing ERO-endorsed NATF CIP-013 implementation guidance to include CIP-013-2 and to incorporate the NATF supply chain security model, criteria, questionnaire, and revision process.

"NATF CIP-013 Implementation Guidance: Supply Chain Risk Management Plans"

This guidance addresses how the use of the NATF supply chain security model, criteria, and questionnaire, if implemented appropriately, offers one method to meet compliance with CIP-013-1 and CIP-013-2 Requirements R1 and R2 to develop and implement supply chain cyber security risk management plans for high and medium impact Bulk Electric System (BES) Cyber Systems and their associated Electronic Access Control or Monitoring Systems (EACMS) and Physical Access Control Systems (PACS).

The documents are posted on the NATF [Supply Chain Cyber Security Industry Coordination website](#) and on the [NERC website](#).

NATF Criteria, Questionnaire, and Revision Process Updates Posted for Industry-Wide Comment through April 13

The NATF Criteria and Questionnaire Revision Team has reviewed suggestions for modifications to the "NATF Supply Chain Security Criteria," "Energy Sector Supply Chain Risk Questionnaire," and associated revision process. The proposed changes have been posted for industry-wide comment through April 13 on the NATF [Supply Chain Cyber Security Industry Coordination](#) page. Input can be submitted to supplychain@natf.net.

A summary of changes is available in the "Version History" notes section of each document. Please review the criteria, questionnaire, and revision process for changes indicated by red text. The redlines for the questionnaire are provided in the formatted version only; conforming final changes will be made to the unformatted version.

The revision team will review comments in April and May and provide a summary of its determinations. The updated documents will be posted following NATF board approval in June.

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FERC Order 881 (Ambient-Adjusted Ratings)

The NATF has initiated an effort to work with members towards implementation of FERC Order 881 (“Managing Transmission Line Ratings”), which is an important order for transmission. Elements include webinars and a multidisciplinary group to discuss challenges and identify potential work on best practices.

NATF Resilience Work Continues with Roadmap

The NATF has been actively working to support and improve transmission system resilience for nearly a decade. We have worked internally with members and externally with industry and regulatory entities (e.g., EPRI, the ERO, DOE, FERC, and PNNL) on efforts such as grid security emergencies, a pandemic response plan, resilience summits and webinars, the RESTORE spare-sharing program, and the Transmission Resilience Maturity Model.

The recently completed resilience roadmap will help NATF members develop and sustain a holistic resilience program for the transmission business. The roadmap identifies crucial elements of comprehensive resilience program management and provides implementation examples. Many of the concepts can also be applied at the enterprise level. For more information about NATF resilience work, see our “[Transmission Resilience Overview](#).”

Redacted Operating Experience Reports

We recently posted three new operating experience reports to the “[Documents](#)” section of our public site for members and other utilities to use internally and share with their contractors to help improve safety, reliability, and resilience.

For more information about the NATF, please visit <https://www.natf.net/>.