NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

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:	Federal Energy Regulatory Commission (FERC) Order No. 901 – Milestone 4: Operational Studies		
Date Submitted:	8/20/2025		
SAR Requester			
Name:	Jack Gibfried, JP Skeath, Nadia Smith		
Organization:	North American Electric Reliability Corporation (NERC)		
Telephone:	470-432-8484 (Jack Gibfried) 404-823-1365 (JP Skeath) 404-805-4725 (Nadia Smith)	Email:	jack.gibfried@nerc.net john.skeath@nerc.net nadia.smith@nerc.net

SAR Type (Check as many as apply)	
☒ New Standard	☐ Imminent Action/ Confidential Issue (SPM Section 10)
☒ Revision to Existing Standard	☐ Variance development or revision
☒ Add, Modify or Retire a Glossary Term	☐ Other (Please specify)
☐ Withdraw/retire an Existing Standard	

Justification for this proposed standard development project (Check all that apply to help NERC prioritize development)	
☒ Regulatory Initiation	☐ NERC Standing Committee Identified
☒ Emerging Risk (Reliability Issues Steering Committee) Identified	☐ Enhanced Periodic Review Initiated
☒ Reliability Standard Development Plan	☐ Industry Stakeholder Identified

What is the risk to the Bulk Electric System (What Bulk Electric System (BES) reliability benefit does the proposed project provide?):

This Standards Authorization Request (SAR) is initiated by NERC to address directives issued by the Federal Energy Regulatory Commission (FERC) in Order No. 901. FERC issued Order No. 901 on October 19, 2023, which includes directives on new or modified NERC Reliability Standard projects. FERC Order No. 901 addresses a wide spectrum of reliability risks to the grid from the application of inverter-based resources (IBRs), including both utility scale and behind-the-meter or distributed energy resources (DERs).

Within the Order, there are four milestones that include sets of directives to NERC. In the Order, FERC has directed NERC to propose new or modified standards to mitigate reliability gaps in the current NERC Reliability Standards related to IBRs. Specifically, FERC directed NERC to develop new or modified

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Reliability Standards to address the following four broad topic areas related to IBRs: (1) data sharing; (2) data and model validation; (3) planning and operational studies; and (4) performance. In January 2024, NERC filed the initial NERC Standards Development Work Plan to Address FERC Order 901 (hereafter referred to as the "Work Plan"). The Work Plan discusses how NERC will develop Reliability Standards within three tranches (Milestones 2-4) to meet FERC's filing deadlines. Milestone 4 of the Work Plan covers Operations and Planning Assessments. This Standard Authorization Request addresses Milestone 4 – Group 1 of the Work Plan, related to Operational Studies.
Purpose or Goal (What are the reliability gap(s) or risk(s) to the Bulk Electric System being addressed, and how does this proposed project provide the reliability-related benefit described above?):
This SAR addresses specific pieces of the NERC filed Work Plan related to Milestone 4 and addresses the various industry comments to meet the regulatory directives of FERC Order No. 901. This project shall coordinate among other projects (i.e., act as a clearing house to tie directive language to standard revisions), develop standard language (i.e., perform the normal duties of a standard development Project). Specifically, the drafting team will address FERC Order No. 901 directives related to the inclusion of IBR performance and behavior in operational assessments and real-time monitoring of individual IBR plants (i.e., individual IBR) as well as IBR plants in the aggregate across an operator's footprint (i.e., IBR in the aggregate). Further, the drafting team will address the similar FERC Order No. 901 directives to include aggregate DERs in operational assessments and real-time monitoring.
Project Scope (Define the parameters of the proposed project):
The FERC Order No. 901 directives assigned to this SAR are outlined in the Detailed Description section below. Given the intertied nature of the operational planning analysis and real-time monitoring performed by transmission operating entities, this scope is derived by identifying all areas where such analysis is impacted by the directive language in FERC Order 901. The project scope shall address all those directives, and should consider the following objectives during the standards development process: 1. Revise the definition of Real-time Assessment and the definition of Operational Planning Analysis in the Glossary of Terms Used in NERC Reliability Standards to: a. account for the performance and behavior of registered and unregistered IBRs individually and in the aggregate, as well as aggregate DERs; and b. clarify that the terms are inclusive of all generation resources (including IBRs) necessary to adequately assess the performance of the Bulk-Power System for normal and Contingency conditions. 2. Revise the definition of Balancing Contingency Event in the Glossary of Terms Used in NERC Reliability Standards to: a. include sudden reduction of output from individual or aggregate IBR during or shortly after a Contingency if this sudden reduction of output impacts ACE; and

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b. include sudden reduction of output from aggregate DER during or shortly after a Contingency if this sudden reduction of output impacts ACE.

3. Revise TOP-001 to require Transmission Operators, when determining System Operating Limit exceedances within their Transmission Operator Areas, to obtain and utilize data regarding and to monitor:
   a. the performance and behavior of registered and unregistered IBRs individually and in the aggregate, as well as aggregate DERs; and
   b. all generation resources (including IBRs) necessary to adequately assess the performance of the Bulk-Power System for normal and Contingency conditions.

4. Revise TOP-001 to require Balancing Authorities, when monitoring their Balancing Authority Areas in order to maintain generation-Load-interchange balance within their Balancing Authority Areas and support Interconnection frequency, to account for the performance and behavior of registered and unregistered IBRs individually and in the aggregate, as well as DERs that in the aggregate have a material impact on the Bulk-Power System.

5. Revise TOP-002 to require Balancing Authorities to address, in their next day Operating Plans, the performance and behavior of registered and unregistered IBRs individually and in the aggregate, as well as DERs that in the aggregate have a material impact on the Bulk-Power System.

6. Strongly consider revising IRO-002 to require Reliability Coordinators, to identify any System Operating Limit exceedances and to determine any Interconnection Reliability Operating Limit exceedances within their Reliability Coordinator areas, to monitor:
   a. the performance and behavior of registered and unregistered IBRs individually and in the aggregate, as well as aggregate DERs, when determining System Operating Limit exceedances within its Transmission Operator Area; and
   b. all generation resources (including IBRs) necessary to adequately assess the performance of the Bulk-Power System for normal and Contingency conditions when determining System Operating Limit exceedances within its Transmission Operator Area.

7. Revise IRO-017 to require Reliability Coordinators, in the evaluations of the impact of Transmission and generation outages within their Wide Areas in their outage coordination processes, to include:
   a. the performance and behavior of registered and unregistered IBRs individually and in the aggregate, as well as aggregate DERs; and
   b. all generation resources (including IBRs) necessary to adequately assess the performance of the Bulk-Power System for normal and Contingency conditions.

8. Revise FAC-011 to:
   a. require Reliability Coordinators, in their methods for determining stability limits to be used in operations in their SOL methodologies, to:

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i. describe that all generation resources (including IBRs) necessary to adequately assess the performance of the Bulk-Power System for normal and Contingency conditions need to be included in the study models used for determining stability limits; and ii. describe that the performance and behavior of registered and unregistered IBRs individually and in the aggregate, as well as aggregate DERs, need to be included in their study models used for determining stability limits; and b. to require Reliability Coordinators, in the sets of Contingency events used to determine stability limits and the sets of Contingency events used in performing Operational Planning Analysis and Real-time Assessments, to include: i. Contingencies based on the performance and behavior of registered and unregistered IBRs individually and in the aggregate, as well as aggregate DERs; and ii. Contingencies for all generation resources (including IBRs) necessary to adequately assess the performance of the Bulk-Power System for normal and Contingency conditions. 9. Revise PRC-012 to require Reliability Coordinators, when evaluating a RAS, to include all generation resources (i.e., all generation resources including all IBRs) necessary to adequately assess the performance of the Bulk-Power System for normal and Contingency conditions. The Drafting Team shall ensure that implementation plans for new or modified Reliability Standards related to Milestone 4 of the Work Plan are aligned and do not create a reliability gap during implementation and ensure consistency in timelines with FERC Orders and other Reliability Standards under development.
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 justification[1] of developing a new or revised Reliability Standard or definition, which includes a discussion of the risk and impact to reliability-of the BES, and (2) a technical foundation document (*e.g.,* research paper) to guide development of the Standard or definition):
The project scope above will need to account for the specific FERC Directive text in FERC Order 901 to be successful. The drafting team should consider the specific language in the FERC directives, as well as any comments in the FERC Order No. 901 proceeding that FERC directed NERC to consider as part of the standard development process. **FERC Order 901 Directives Assigned to this SAR:** Included in the Work Plan is a list of the directives in FERC Order No. 901 and their associated mapping to each SAR submitted by NERC. This SAR will address the following FERC Order No. 901 directives:

[1] 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.

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1. "Finally, by November 4, 2026, NERC must submit new or modified Reliability Standards addressing planning and operational studies for registered IBRs, unregistered IBRs, and IBR–DERs in the aggregate." (P 7) 2. "We adopt the NOPR proposal and direct NERC to submit to the Commission for approval one or more new or modified Reliability Standards that require reliability coordinators and transmission operators to include the performance and behavior of registered and unregistered IBRs individually and in the aggregate, as well as IBR–DERs in the aggregate, (e.g., IBRs tripping or entering momentary cessation individually or in the aggregate) in their operational planning analyses, real-time monitoring, and real-time assessments, including non-bulk electric system data and external power system network data identified in their data specifications. Further, we agree with commenters and direct NERC to submit to the Commission for approval new or modified Reliability Standards requiring reliability coordinators and transmission operators, when performing operational studies, as well as operational planning analyses, real-time monitoring, real-time assessments, and other analyses, to include in these studies all generation resources (i.e., all generation resources including all IBRs) necessary to adequately assess the performance of the Bulk-Power System for normal and contingency conditions." (P 176) 3. "We adopt the NOPR proposal and direct NERC to submit to the Commission for approval one or more new or modified Reliability Standards that require balancing authorities to include the performance and behavior of registered and unregistered IBRs individually and in the aggregate, as well as IBR–DERs that in the aggregate have a material impact on the Bulk-Power System, (e.g., resources tripping or entering momentary cessation individually or in the aggregate) in their operational analysis functions and real-time monitoring to support the reliable operation of the Bulk-Power System during normal and contingency conditions." (P 177) 4. "Further, we believe that there is a need to have all of the directed Reliability Standards effective and enforceable well in advance of 2030 and direct NERC to ensure that the associated implementation plans sequentially stagger the effective and enforceable dates to ensure an orderly industry transition for complying with the IBR directives in this final action prior to that date." (P 226)
Cost Impact Assessment, if known (Provide a paragraph describing the potential cost impacts associated with the proposed project):
The cost associated with implementation of these new or modified standards is currently unknown.
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

Requested information
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 NERC Rules of Procedure Appendix 5A:
Reliability Coordinator Transmission Operator Balancing Authority
Do you know of any consensus building activities[2] in connection with this SAR? If so, please provide any recommendations or findings resulting from the consensus building activity.
FERC Order No. 901 NERC Standards Development Work Plan to Address FERC Order 901 Inverter-Based Resource Activities, Quick Reference Guide Distributed Energy Resource Activities, Quick Reference Guide IBR Registration Initiative, Quick Reference Guide RSTC comment process; response to comments received
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)?
1. Standards: *a. BAL-002* *b. FAC-011* *c. FAC-014* *d. IRO-002* *e. IRO-008* *f. IRO-009* *g. IRO-010* *h. IRO-014* *i. IRO-018* *j. TOP-001* *k. TOP-002* *l. TOP-003* *m. TOP-010* 2. SARs: a. SAR titled: Federal Energy Regulatory Commission (FERC) Order No. 901 – Milestone 4: Planning Studies 3. Active Reliability Standard Projects: a. Project 2020-06 Verifications of Models and Data for Generators b. Project 2021-01 System Model Validation with IBRs c. Project 2022-02 Uniform Modeling Framework for IBR

[2] 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.

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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 with the benefits of using them.
Because this SAR is addressing directives from FERC Order No. 901, there are no other alternatives that could meet the objectives.

Reliability Principles	
Does this proposed standard development project support at least one of the following Reliability Principles (Reliability Principles)? Please check all those that apply.	
☒	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.
☒	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.
☒	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.
☐	4. Plans for emergency operation and system restoration of interconnected bulk power systems shall be developed, coordinated, maintained and implemented.
☐	5. Facilities for communication, monitoring and control shall be provided, used and maintained for the reliability of interconnected bulk power systems.
☐	6. Personnel responsible for planning and operating interconnected bulk power systems shall be trained, qualified, and have the responsibility and authority to implement actions.
☐	7. The security of the interconnected bulk power systems shall be assessed, monitored and maintained on a wide area basis.
☐	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
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).	
☐ Draft SAR reviewed by NERC Staff ☐ Draft SAR presented to SC for acceptance ☐ DRAFT SAR approved for posting by the SC	☐ Final SAR endorsed by the SC ☐ SAR assigned a Standards Project by NERC ☐ SAR denied or proposed as Guidance document
Risk Tracking.	
☐ Grid Transformation ☐ Resilience/Extreme Events	☐ Energy Policy ☐ Critical Infrastructure Interdependencies
☐ Security Risks	

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
5	August 14, 2023	Standards Development Staff	Updated template as part of Standards Process Stakeholder Engagement Group
6	June 4, 2023	Standards Information Staff	Updated link to the NERC Reliability Principles