

## 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:   | Modifications to VAR-002-4.1 (as revised by the SAR Drafting Team)                               |                                     |  |
| Date Submitted:  | June 10, 2020 (March 7, 2022)  |                                     |  |
| SAR Requester  |  |                                     |  |
| Name:  | Allen Shriver, Chair (Revised by Project 2021-02 SAR Drafting Team)<br>Jeffery Billo, Vice Chair |                                     |  |
| Organization:  | Inverter-Based Resource Performance Task Force (IRPTF)   |                                     |  |
| Telephone:   | Allen: 561-904-3234<br>Jeffery: 512-248-6334   | Email:                              | <a href="mailto:Allen.Shriver@NextEraEnergy.com">Allen.Shriver@NextEraEnergy.com</a><br><a href="mailto:Jeff.Billo@ercot.com">Jeff.Billo@ercot.com</a> |
| 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>The NERC Inverter-based Resource Performance Task Force (IRPTF) undertook an effort to perform a comprehensive review of all NERC Reliability Standards to determine if there were any potential gaps or improvements based on the work and findings of the IRPTF. The IRPTF identified several issues as part of this effort and documented its findings and recommendations in a white paper. The "IRPTF Review of NERC Reliability Standards White Paper" was approved by the Operating Committee and the Planning Committee in March 2020. Among the findings noted in the white paper, the IRPTF identified issues with VAR-002-4.1 that should be addressed.</p> <p>The purpose of VAR-002-4.1 is "to ensure generators provide reactive support and voltage control, within generating Facility capabilities, in order to protect equipment and maintain reliable operation of the Interconnection." Requirement R3 requires each Generator Operator (GOP) to notify its Transmission Operator (TOP) of a status change on "the AVR, power system stabilizer, or alternative</p> |  |                                     |  |

### Requested information

voltage controlling device within 30 minutes of the change.” Requirement R4 is similar in that it requires each GOP to notify its TOP of “a change in reactive capability due to factors other than a status change described in Requirement R3.”

For dispersed power producing resources, it is not clear if a GOP is required to notify the TOP for the status change of a voltage controlling device on an individual generating unit. For example, if an IBR consisting of one hundred inverters has one inverter trip out of service, is the GOP required to notify the TOP per Requirement R3? NERC Project 2014-01 revised VAR-002 Requirement R4 to clarify that it is not applicable to individual generating units of dispersed power producing resources. The IRPTF did not identify any reason why Requirement R3 should be treated differently than Requirement R4 in this respect and recommended VAR-002-4.1 be modified to make this same clarification to Requirement R3.

In addition, the industry comments request that “Project 2016-EPR-02 Enhanced Periodic Review of Voltage and Reactive Standards” recommendations (Attachment 5) should be considered within the “Project 2021-02 Modifications to VAR-002-4.1 SAR. Recommendations provide a review of VAR-002 Requirements R1-R6 for consideration of IBR Voltage/VAR control and operation.

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

This SAR proposes to revise VAR-002-4.1 to address ambiguities within the existing standard. The goal is to add clarity and address the ambiguity in the existing requirements and requirement parts.

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

The proposed scope of this project is to:

- Clarify VAR-002-4.1 Requirement R3 in regards to whether the GOP of a dispersed power resource must notify its associated TOP of a status change of a voltage controlling device on an individual generating unit, for example if a single inverter goes offline in a solar PV resource.
- Project 2016-EPR-02 Enhanced Periodic Review of Voltage and Reactive Standards recommendations (Attachment 5) should be considered within the Project 2021-02 Modifications to VAR-002-4.1 SAR. Recommendations provide a review of VAR-002 Requirements R1-R6 for consideration of IBR Voltage/VAR control and operation.
- Clarify the requirements for VAR-002 Standard in regard to dispersed power producing resources and make appropriate changes, as necessary.
- Consider specific power system stabilizer (PSS) requirements, as recommended from Project 2016-EPR-02.
- Consider and revise as necessary for an exception to be included in the Applicability section of the Reliability Standard for Requirement R4 reference to the Bulk Electric System (BES) definition that brings in applicability (exception) component of certain Generator Operators, as recommended from Project 2016-EPR-02.
- Consider and revise as necessary Requirement R4 as recommended from Project 2016-EPR-02: “Requirement R4 is silent on the magnitude or quantity of ‘change in reactive capability’ (e.g. 1 MVAR or 100 MVAR). Requirement R4 should be reviewed for potential improvements in

| <b>Requested information</b>  |
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| <p>establishing the level of change that triggers “change in reactive capability” or where that level of change would be identified.”</p> <ul style="list-style-type: none"> <li>• Consider and revise as necessary the Measures, Time Horizons, and Violation Severity Levels (VSLs), as recommended from Project 2016-EPR-02.</li> <li>• Correct capitalization, punctuation, and syntax as necessary and as recommended from Project 2016-EPR-02.</li> <li>• Consider NERC Odessa Disturbance Report recommendations for modifications or additions to existing requirements.</li> </ul> |
| <p>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<sup>1</sup> 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):</p>  |
| <p>The Standards Drafting Team should clarify the VAR-002-4.1 Requirements in regards to a dispersed power resource utilizing the “IRPTF Review of NERC Reliability Standards White Paper” and the “Project 2016-EPR-02 Enhanced Periodic Review of Voltage and Reactive Standards Attachment 5” recommendations.</p>   |
| <p>Cost Impact Assessment, if known (Provide a paragraph describing the potential cost impacts associated with the proposed project):</p>   |
| <p>The SAR proposes to clarify VAR-002-4.1 Requirements. The cost impact is unknown, but it is expected to be minimal since it should only impact communication procedures and IBR descriptive language within the VAR-002 Reliability Standard.</p>  |
| <p>Please describe any unique characteristics of the BES facilities that may be impacted by this proposed standard development project (e.g., Dispersed Generation Resources):</p>  |
| <p>Dispersed power producing resources are made up of multiple individual generating units. It may be impractical, place an undue burden upon the associated GOPs and TOPs, and have no material reliability benefit to have GOPs notify TOPs in regards to the status change of a voltage controlling device on a single individual generating unit.</p>   |
| <p>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):</p>   |
| <p>Generator Operators, Generator Owners, and Transmission Operators.</p>   |
| <p>Do you know of any consensus building activities<sup>2</sup> in connection with this SAR? If so, please provide any recommendations or findings resulting from the consensus building activity.</p>  |
| <p>This issue was captured in the “IRPTF Review of NERC Reliability Standards White Paper” which was approved by the Operating Committee and the Planning Committee. The Standards Committee</p>  |

<sup>1</sup> 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.

<sup>2</sup> 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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| accepted the proposed recommendations in the “Project 2016-EPR-02 Enhanced Periodic Review of Voltage and Reactive Standards” report.                             |
| 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)?   |
| TOP-003, Operational Data Exchange Simplification SAR.  |
| 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 IRPTF did not identify any alternatives since the language in VAR-002-4.1 needs clarification.  |

| Reliability Principles  |   |
|---|---|
| Does this proposed standard development project support at least one of the following Reliability Principles ( <a href="#">Reliability Interface Principles</a> )? 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 checked="" 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 <a href="#">Market Interface Principles</a> ?                                    | Enter<br>(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 | Yes               |

**Market Interface Principles**

access commercially non-sensitive information that is required for compliance with reliability standards.

**Identified Existing or Potential Regional or Interconnection Variances**

| Region(s)/ Interconnection | Explanation |
|----------------------------|-------------|
| None                       | N/A         |

**For Use by NERC Only**

SAR Status Tracking (Check off as appropriate).

|   |  |
|---|--|
| <input type="checkbox"/> Draft SAR reviewed by NERC Staff         | <input type="checkbox"/> Final SAR endorsed by the SC                |
| <input type="checkbox"/> Draft SAR presented to SC for acceptance | <input type="checkbox"/> SAR assigned a Standards Project by NERC    |
| <input type="checkbox"/> DRAFT SAR approved for posting by the SC | <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                    |