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: | Applicability revisions for transmission connected dynamic reactive resources |
| Date Submitted: | May 21, 2021 |

**SAR Requester**

Name: Brad Marszalkowski (chair)

Organization: Project 2020-06 SAR Drafting Team; original submitted by Hari Singh (SAMS)

Telephone: 413-535-4050

Email: bmarszalkowski@iso-ne.com

**SAR Type (Check as many as apply)**

- [x] New Standard
- [ ] Revision to Existing Standard
- [x] Add, Modify or Retire a Glossary Term
- [ ] Withdraw/retire an Existing Standard
- [ ] Imminent Action/ Confidential Issue (SPM Section 10)
- [ ] Variance development or revision
- [ ] Other (Please specify)

**Justification for this proposed standard development project (Check all that apply to help NERC prioritize development)**

- [ ] Regulatory Initiation
- [ ] Emerging Risk (Reliability Issues Steering Committee) Identified
- [x] NERC Standing Committee Identified
- [ ] Enhanced Periodic Review Initiated
- [ ] Industry Stakeholder Identified

**Industry Need (What Bulk Electric System (BES) reliability benefit does the proposed project provide?)**:

Dynamic reactive resources used to provide Essential Reliability Services (ERS) in the BES include generation resources (rotating machine and inverter-based) as well as transmission connected dynamic reactive resources (power-electronics based). Existing reliability standards for verifying the capability, modeling and performance of dynamic reactive resources are only applicable to Facilities comprising generation resources. Augmenting the applicability of these standards to include (non-generation) transmission-connected reactive resources – both rotating machine (i.e. synchronous condenser) and power-electronics based – will enhance the BES reliability by ensuring that the capability, models and performance is verified and validated for all varieties of dynamic reactive resources utilized in providing ERS in the BES.

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

Augment the “Applicability – Facilities” and “Applicability-Functional Entities” sections in MOD-026 and MOD-027 reliability standards to address (non-generation) transmission-connected dynamic reactive resources.
resources – both rotating machine (i.e. synchronous condenser) and power-electronics based. Also modify Requirements (including applicable attachments) as needed to ensure they continue to address the additional Facilities. As needed, also define new Glossary Terms for all or some of the transmission-connected dynamic reactive devices noted in the SAMS white-paper “Transmission Connected Dynamic Reactive Resources – Assessment of Applicability in Reliability Standards”.

Project Scope (Define the parameters of the proposed project):
Revise the “Applicability – Facilities” section, “Applicability – Functional Entities” section, and Requirements (including applicable attachments) as needed in MOD-026 and MOD-027 reliability standards to comprehensively address all varieties of transmission-connected dynamic reactive resources that are utilized in providing ERS in the BES.

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 justification1 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 “Applicability – Facilities” and “Applicability-Functional Entities” sections in MOD-026 and MOD-027 reliability standards will be revised to address (non-generation) transmission-connected dynamic reactive resources (TCDRR) based on the recommendations summarized in Table 1 of the SAMS white-paper “Transmission Connected Dynamic Reactive Resources – Assessment of Applicability in Reliability Standards”. The white-paper also provides the technical justifications for the recommended revisions and the associated reliability benefits.

The SDT will address the following deliverables:
1. Review, and if necessary, update MOD-026/027 to be inclusive of TCDRR with focus on the following:
   a. Applicability section(s)
   b. Similar to R2.1, identify what the Responsible Entity (TO) should provide for verifications to include but not limited to documentation, equipment information, model structure and data, and compensation settings
   c. Other sections of MOD-026/027 pertinent to verification of models including periodicity
2. Review, and if necessary, update MOD-026/027 to clarify language for model verification of TCDRR
3. As needed, also define new Glossary Terms for TCDRR or related terms
4. In the alternative, develop a new MOD reliability standard that addresses the above.

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

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

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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.
### Requested information

Power-electronics based transmission-connected reactive resources – also known as FACTS (Flexible AC Transmission System) devices – such as: Static Var Compensator (SVC), Static Synchronous Compensator (STATCOM), HVDC Links (LCC or VSC).

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):

- Transmission Owners in addition to the existing Functional Entities

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.

“Transmission Connected Dynamic Reactive Resources – Assessment of Applicability in Reliability Standards” white-paper approved by SAMS members.

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)?

- PRC-019 SAR requested by SPCS and PRC-024 SAR requested by IRPTF

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.

- No viable alternatives were found by SAMS.

### 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.

- 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.

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\(^2\) 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.
### Market Interface Principles

Does the proposed standard development project comply with all of the following Market Interface Principles?

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<tr>
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<th>Enter (yes/no)</th>
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<tbody>
<tr>
<td>1. A reliability standard shall not give any market participant an unfair competitive advantage.</td>
<td>Yes</td>
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<td>2. A reliability standard shall neither mandate nor prohibit any specific market structure.</td>
<td>Yes</td>
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<td>3. A reliability standard shall not preclude market solutions to achieving compliance with that standard.</td>
<td>Yes</td>
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<td>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.</td>
<td>Yes</td>
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### Identified Existing or Potential Regional or Interconnection Variances

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<th>Explanation</th>
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<td>e.g. NPCC</td>
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**For Use by NERC Only**

### 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

### Version History

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