

# Unofficial Comment Form

## Project 2020-06 Verification of Models and Data for Generators

**Do not** use this form for submitting comments. Use the [Standards Balloting and Commenting System \(SBS\)](#) to submit comments on draft one of Reliability Standard **MOD-026-2 Verification of Dynamic Models and Data for BES Connected Facilities** by **8 p.m. Eastern, Wednesday, July 6, 2022**.

Additional information is available on the [project page](#). If you have questions, contact Senior Standards Developer, [Chris Larson](#) (via email), or at 404-446-9708.

### Background

The NERC Inverter-based Resource (IBR) Performance Task Force (IRPTF) performed a comprehensive review of all NERC Reliability Standards to identify any potential gaps and/or improvements. The IRPTF discovered several issues as part of this effort and documented its findings and recommendations in the IRPTF Review of NERC Reliability Standards White Paper, which was approved in March 2020 by the Operating Committee and the Planning Committee (now part of the Reliability and Security Technical Committee (RSTC)). Among the findings noted in the white paper, the IRPTF identified issues with MOD-026-1 and MOD-027-1 that should be addressed. The RSTC endorsed the standard authorization request (SAR) on June 10, 2020.

Consistent with the IRPTF recommendations, the scope of the proposed SAR includes revisions to NERC Reliability Standards MOD-026-1 and MOD-027-1. These standards require, among other things, Generator Owners to provide verified dynamic models to their Transmission Planner for the purposes of power system planning studies. The project proposed revisions to MOD-026-1 and MOD-027-1 to clarify requirements related to IBRs, and to require sufficient model verification to ensure accurate generator representation in dynamic simulations. The IRPTF recommended revisions to clarify the applicable requirements for synchronous generators and IBRs.

Additionally, the potential risk of increasing amounts of reactive power being supplied by nonsynchronous sources was identified in NERC's 2017 Long-term Reliability Assessment. In response to the concern, the Planning Committee (PC) assigned the System Analysis and Modeling Subcommittee (SAMS) to study the issue. The SAMS developed the Applicability of Transmission-Connected Reactive Devices white paper, which was approved by the PC at its December 2019 meeting. The PC Executive Committee approved the SAR on February 11, 2020. Recommended revisions to MOD-026-1 and MOD-027-1 outlined in the SAR were undertaken within the scope of this project.

Please provide your responses to the questions listed below, along with any detailed comments.

## Questions

1. The standard drafting team (SDT) proposes combining MOD-026-1 and MOD-027-1 into a single standard, MOD-026-2, due to the efficiency of having one standard with common process and requirement language. Do you agree with this approach? If you do not agree, please provide your recommendation and, if appropriate, technical or procedural justification.

- Yes  
 No

Comments:

2. Do you agree the language proposed in MOD-026-2 Requirement R1? If you do not agree, please provide your recommendation and, if appropriate, technical or procedural justification.

- Yes  
 No

Comments:

Requirement R1 instructs the TP to maintain a requirement document that states the accepted models and the level of detail needed. This requirement is largely covered by MOD-032, R1, and is therefore partially redundant.

The Transmission Planning (TP) and Planning Authority (PA) jointly developing dynamic model requirements and processes recognizes that there may be regional transmission system concerns for which different requirements and processes are appropriate. There should be some bare minimum requirements defined in the MOD-026 standard which apply to everyone since the impacts of dynamic events commonly analyzed are not limited by TP or PA area. As an example, the August 14, 2004 blackout impacted much more than one TP or PA area. The models provided as required by R1 have impacts that affect all nearby TPs and PAs – and to some extent all TPs and PAs in the associated AC interconnection (Eastern, Western, Quebec).

3. Do you agree the language proposed in MOD-026-2 Requirements R2 and R3? If you do not agree, please provide your recommendation and, if appropriate, technical or procedural justification.

- Yes  
 No

Comments:

4. Do you agree the language proposed in MOD-026-2 Requirements R4 and R5? If you do not agree, please provide your recommendation and, if appropriate, technical or procedural justification.

- Yes  
 No

Comments:

NPCC RSC suggests that the 20MVA threshold identified in Applicability section 4.2.4 should be inclusive of multiple units aggregated to 20 MVA at a station (substation, switching station, generating station). Some locations may have multiple smaller (for example 15MVA) reactive

resources of the types mentioned in R4.2.4.2 in order to meet reliability criteria which can consider the contingent loss of one or a number of the resources. The impact of multiple units (for example 2 units of 15MVA each) on the results of the analysis can be more notable than a single 20MVA resource.

5. Do you agree the language proposed in MOD-026-2 Requirement R6? If you do not agree, please provide your recommendation and, if appropriate, technical or procedural justification.

Yes  
 No

Comments:

R6.1 requires that the OEM state that the EMT model represents the IBR equipment supplied by the OEM. This sub requirement should also require that the OEM state that the EMT model is equivalent to the positive-sequence model provided to satisfy R4 or R5. While the EMT and positive-sequence models are utilized by different tools for different types of analysis, the OEM should be required to document that the EMT and positive-sequence models are as accurate and similar as the tools allow the physical equipment to be represented.

6. Do you agree the language proposed in MOD-026-2 Requirements R7, R8, and R9? If you do not agree, please provide your recommendation and, if appropriate, technical or procedural justification.

Yes  
 No

Comments:

7. The SDT believes the language of MOD-026-2 addresses the issues outlined in the two SARs in a cost effective manner. Do you agree? If you do not agree, or if you agree but have suggestions for improvement to enable more cost effective approaches, please provide your recommendation and, if appropriate, technical or procedural justification.

Yes  
 No

Comments:

8. The SDT proposes a 1 year implementation plan for Requirements R1, R7, R8, and R9, with an additional 2 years for compliance with Requirements R2-R6 for newly applicable Facilities. For existing Facilities, the Implementation Plan proposes the ten year reoccurring periodicity is maintained from the date of previous model verification. Would these proposed timeframes give enough time to put into place process, procedures or technology to meet the proposed language? If you think an alternate timeframe is needed, please propose an alternate implementation plan and time period, and provide a detailed explanation of actions planned to meet the implementation deadline.

Yes  
 No

Comments:

9. Provide any additional comments on the standard and technical rationale document for the SDT to consider, if desired.

Comments:

To better align with the Standards Alignment with Registration NERC project (2017-07), Planning Authority should be replaced with the Planning Coordinator in all documents related to this project (MOD-026-2, Implementation Plan, Mapping Document, VRF/VSL Justifications, and Technical Rationale).

The Transmission Owner should not be responsible for gathering modeling data for equipment we do not own. MOD-026-2 Verification of Dynamic Models and Data for BES Connected Facilities applies to GO, TP, PA, and **TO**. The way certain requirements are written (the drafting team may have had good intentions) gathering of data is not only the responsibility of the GO (as it should) but it has a statement “or Transmission Owner”.

Examples:

**R2: For synchronous generation identified in Section 4.2.1 or 4.2.2 or a synchronous condenser identified in Section 4.2.4.1, each Generator Owner or Transmission Owner shall provide a verified positive sequence dynamic model(s), associated parameters, and accompanying information that represents the in-service equipment of the Facility to its Transmission Planner, in accordance with the periodicity in MOD-026-2 Attachment 1.**

I am guessing TO would be responsible for the “synchronous condenser”? This should be written to tie it to the owner.

**R4: For inverter-based resources (IBRs) identified in Section 4.2.3, FACTS devices identified in Section 4.2.4.2, and VSC HVDC identified in section 4.2.5.2, each Generator Owner or Transmission Owner shall provide a verified positive sequence dynamic model(s), associated parameters, and accompanying information that represent the in-service equipment of the Facility to its Transmission Planner, in accordance with the periodicity in MOD-026-2 Attachment 1.**

NPCC RSC does not agree with the ten-year period described in Attachment 1, Rows 3 & 7 due to the potential for frequent changes to the maturing technology of utility-scale inverters. Inverter manufacturers will undoubtedly issue numerous upgrades and security fixes to the inverter firmware over a 10-year period. The GO or TO will install many of these firmware upgrades and likely all of the security-related ones so as to not be hacked because of known insecure firmware. Since firmware changes can notably impact the operation of the inverter, Eversource suggests changing the 10-year period to a 5-year period in order to balance the need for accurate models with the burden of verifying what the models should be.