

# Technical Rationale for Reliability Standard MOD-032-2

May 2023

## MOD-032-2 – Data for Power System Modeling and Analysis

### Rationale for Applicability Section

For MOD-032-2, Load-Serving Entity (LSE) was replaced with Distribution Provider (DP) because of the removal of LSEs from the NERC registry criteria. Items in Attachment 1 that were previously required to be provided by the LSE are now required to be provided by the DP. It is recognized that some distribution facilities do not have an associated DP that meets the NERC registration criteria. In such instances, the specified data is required to be provided by the Transmission Owner (TO) or registered DP to which those facilities are connected. It is expected that TOs (or registered DPs) may need to coordinate with the owners of distribution facilities that do not have an associated NERC-registered DP to ensure the availability of the necessary data, either through interconnection agreements or other binding contracts.

Additionally, the standard drafting team (SDT) reviewed the dual applicability to Planning Authority and Planning Coordinator and determined that that the explanation from MOD-032-1 is still correct and valid with minor edits as proposed. The posted "[Appendix 5B: Statement of Compliance Registry Criteria](#)", dated January 19, 2021, still uses the Planning Authority term.

### Rationale for Distributed Energy Resource (DER) Definition

The SDT considered various DER definitions utilized in the industry and discussed in the [SPIDERWG Terms and Definitions Working Document](#). The SDT chose to refer to technologies connected to the DP's system to avoid ambiguities associated with defining a distribution system. The NERC glossary definition for DP notes that the DP is defined by providing the distribution function (this includes entities that may not be NERC-registered DPs). Additionally, by specifying facilities that produce active power, the scope is focused on only those facilities that may be exporting real power to the power system or offsetting real power load (e.g., residential solar or commercial rooftop solar, even if they only operate at unity power factor or don't have any reactive power capability). This would exclude examples such as charging-only electric vehicle (EV) installations and controllable load options. The SDT included "in non-isolated parallel operation with the Bulk Power System." to indicate that distributed energy resources with potential BES reliability impacts are those that are actually electrically connected to the BES. Resources that are only operated in an islanded or isolated mode (e.g., back-up generation that only operates when a facility is disconnected from the grid), will not have an impact to the BES and therefore are not of interest from a BES-reliability perspective. The SDT understands the concepts of non-isolated parallel operation versus isolated parallel operation to be commonly understood within the industry.

The SDT consensus is that this definition clarifies what is in scope and out of scope with respect to where DER is connected rather than the technology type. Utilizing the existing NERC definition for DP and the associated area of responsibility aligns with the scope of DER data collection and modeling activities and

provides clarity for the industry to aid in gathering this information. It should be clear that MOD-032-2 applicability and compliance obligations refer to NERC-registered DPs; the use of the DP term in the DER definition does not in itself imply any compliance obligation.

### **Rationale for Modifications to Attachment 1**

MOD-032-2 Attachment 1: Data Reporting Requirements was updated with data specific to DERs. The intent is that all relevant DER data including both utility scale facilities (commonly referred to as U-DER) and smaller behind-the meter facilities (commonly referred to as R-DER) be available and represented in models of the interconnected transmission system consistent with the approved [Reliability Guideline: DER Data Collection for Modeling in Transmission Planning Studies](#). Specific data items listed for DER reflect the minimum amount of information expected to be needed to reasonably represent DER in transmission system models. It is expected that aggregate DER (rather than individual DER facilities) would be represented in most Planning Coordinator/Transmission Planner (PC/TP) study models. However, footnote 4 explicitly allows the PC/TP to require either aggregated or unaggregated DER data. This provides flexibility for local practices wherein the PC/TP may elect to apply DER aggregation assumptions rather than depend on the DP/TO to apply aggregation assumptions.

The PC/TP may have access to sufficient data for modeling certain DER through alternative means (e.g., direct registration of DER in certain markets). In such cases, the DP (or TO) should not be obligated to provide duplicate DER modeling data. The PC/TP modeling data requirements and reporting procedures should clearly identify if there are certain classifications of DER that are excluded from the DP/TO obligation for providing DER modeling data. This in no way absolves a DP/TO from an obligation to provide DER data according to the data requirements and reporting procedures developed by its Planning Coordinator and Transmission Planner in Requirement R1.

The SDT decided to maintain an approach similar to MOD-032-1 where more detailed sub-bullets associated with the required data are only presented in the “steady state” column (though arguably such data is also relevant to “dynamics” and/or “short circuit”). The addition to the “dynamics” column was limited to the “Distributed Energy Resource (DER) data” line item. The SDT concluded that this was appropriate and consistent with other “dynamics” line items such as “Wind Turbine Data” and “Photovoltaic systems” that are listed without detailed sub-bullets. Drastically altering the structure of Attachment 1 or adding DER data to the “short circuit” column was beyond the scope of the Project 2022-02 SAR.

It should be noted that the modifications do not make DER facilities subject to NERC reliability standards. Instead, the modifications place a compliance obligation on NERC registered DPs (or TOs) to provide basic information about DER that are connected to their systems so that DER can be properly represented in interconnection-wide cases. There are already existing requirements for DPs (or TOs) to provide information about load connected to their systems. Similar to load, DER is not generally considered to be a BES facility. However, BES reliability assessments require an accurate representation of both aggregate load and aggregate DER behavior. The modifications proposed in MOD-032-2 are intended to ensure sufficient DER data is available to the PC/TP so that appropriate DER representations can be included in their BES reliability assessments.

- **Inclusion of In-Service Date or Other Information**

As suggested in the approved [Reliability Guideline: DER Data Collection for Modeling in Transmission Planning Studies](#), the in-service date for DER may be used as a proxy for the PC/TP to make reasonable assumptions about DER capabilities. For example, in a certain jurisdiction DER installed after a specified date may be required to have a certain ride-through characteristic. Thus, the appropriate ride-through characteristic representation for DER in that area could be inferred by the in-service date of the DER. However, the PC/TP modeling data requirements and reporting procedures may require the provision of alternative information to achieve the same purpose. PC/TP modeling data requirements and reporting procedures may also require more detail and/or additional information. In cases where the PC/TP data requirements and reporting procedures require aggregated DER data to be provided, it is expected that the proportion of aggregate DER amount with in-service dates before and after certain threshold dates would be needed to make inferences regarding the overall aggregate DER response characteristics.

- **Inclusion of Data Related to DER Feeders Subject to UFLS and/or UVLS**

There is a reliability need for the DP/TO to convey this information to the PC/TP. As described in the approved [Reliability Guideline: Recommended Approaches for UFLS Program Design with Increasing Penetrations of DERs](#), accurately representing DER tripping as part of UFLS operation is vital for designing and evaluating UFLS programs. Similarly, accurately representing DER tripping as part of UVLS operation is vital for designing and evaluating UVLS programs as described in the approved [White Paper: DER Impact to Under Voltage Load Shedding Program Design](#). In cases where the PC/TP data requirements and reporting procedures require aggregated DER data to be provided, the proportion of aggregate DER subject to each UVLS/UFLS tripping stage should be identified.

- **Inclusion of Aggregate Demand Clarification**

Footnote 2 was modified to clarify that the gross demand is needed at each load serving bus. Collecting and modeling a net demand that incorporates offsets due to output from DER is not consistent with a modeling framework that explicitly represents DER.