

# System Planning Impacts from Distributed Energy Resources Working Group (SPIDERWG)

Scope Document  
December 2018

## Purpose

The NERC Planning Committee (PC) identified key points of interest that should be addressed related to a growing penetration of distributed energy resources (DER). The purpose of the System Planning Impacts from Distributed Energy Resources (SPIDERWG) is to address aspects of these key points of interest related to system planning, modeling, and reliability impacts to the Bulk Power System (BPS). This effort builds off of the work accomplished by the NERC Distributed Energy Resources Task Force (DERTF)<sup>1</sup> and the NERC Essential Reliability Services Task Force/Working Group (ERSTF/ERSWG)<sup>2</sup>, and addresses some of the key goals in the ERO Enterprise Operating Plan<sup>3</sup>.

## Activities

NERC SPIDERWG will serve as a stakeholder forum for focusing on DER from a transmission planning and system analysis perspectives. Some of the primary focuses of SPIDERWG will be DER data collection, modeling practices, model improvements, and steady-state and dynamic simulation assessments. On a secondary level, SPIDERWG will be a stakeholder forum for focusing on system planning impacts to BPS essential reliability services (ERS), load forecasting, and other considerations that develop as the industry assesses the increasing influences of DER on the BPS. SPIDERWG will work with the Planning Committee and other Planning Committee subcommittees, working groups, and task forces as necessary to provide as complete an analysis that is required. Key activities of the SPIDERWG include, but are not limited to, the following:

1. Develop detailed guidelines related to recommended information sharing and data collection for necessary information to flow across the transmission-distribution interface effectively to support BPS reliability needs.
2. Develop recommended practices and guidance for system planning assessments of the performance<sup>4</sup> of the BPS under increasing penetrations of aggregate DER.
3. DER model benchmarking and development of guidelines for model verification comparing modeled performance against actual system data, as available.

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<sup>1</sup> [DERTF Final Report](#)

<sup>2</sup> [ERSWG Final Framework Report](#)

<sup>3</sup> See Goal 4 in the [NERC ERO Operating Plan](#)

<sup>4</sup> This may include ERS, planning criteria impacts, system stability impacts, and other performance metrics.

4. Provide guidance for distribution-level monitoring that will provide the data necessary to improve steady-state and dynamic modeling of aggregate DER. Monitoring includes the use of smart meters, dynamic disturbance recorders (DDR), phasor measurement units (PMUs), and other recording devices.
5. Provide technical recommendations for the adoption and use of IEEE Std. 1547-2018.
6. Provide guidelines, white papers, compliance guidance, etc. in support of NERC Reliability Standards addressing interconnection requirements.
7. Provide technical assistance in support for assessing DER and DER aggregations in other NERC program areas.
8. Build off of existing NERC Reliability Guidelines for DER modeling and modeling practices, particularly for inclusion of DER in dynamic load models.
9. Develop recommended practices for representing aggregate DER in interconnection-wide planning base cases. This includes developing practices for expected DER dispatches, time of day, DER set points, and other aspects that impact base case configuration.
10. Coordinate with NERC and the MOD-032 Designees to develop processes to include DER in future interconnection-wide base cases consistently.
11. Coordinate with simulation software vendors to seek consistent implementation of DER models in steady-state powerflow and dynamic simulations.
12. Provide assistance to NERC Event Analysis evaluations of BPS disturbances when aggregate DER are involved in the disturbance, as necessary.
13. Provide guidance on impacts that higher penetration of DER may have on system restoration, UVLS, and UFLS, and potential solutions or recommended practices to overcome any identified issues.
14. Support the development of any data collection requirements by the NERC Reliability Assessment Subcommittee (RAS), as necessary, for inclusion in the NERC Long Term Reliability Assessment (LTRA) and other assessments.
15. Develop educational materials that can be used for a range of audiences that describe any potential emerging risks and possible solutions to address these risks.
16. Coordination with NERC System Analysis and Modeling Subcommittee (SAMS) and its technical groups.

## **Deliverables**

The SPIDERWG will develop technical reference documents, guidelines, and other educational materials to support industry efforts in BPS planning under higher penetrations of DER with the following objectives:

1. Assessment of DER performance and event analyses (possible industry survey) and aggregate DER impacts, including expected projections of penetration level and other relevant impacts.
2. Reliability Guideline(s) on system planning and reliability impacts that aggregated DER can have; focus on study approaches and potential solutions to these impacts. System impacts include traditional planning analyses and may also include system restoration, UVLS, and UFLS.
3. Reliability Guideline(s) on data collection and information sharing with respect to DER penetration levels and necessary information for BPS planning and system operation.

4. Modeling Notification or guidance material on DER models and how to use these models appropriately.
5. Recommendations for improvements to DER modeling and model benchmarking.
6. Recommendations to software vendors on DER modeling consistency, including any recommended improvements to software platforms (coordinated with the software vendors) to gain this consistency.
7. Recommendations to the MOD-032 Designees on inclusion of DER in interconnection-wide planning cases, including recommendations on the dispatch and case setup for various scenarios of DER.
8. Recommendations for distribution system monitoring to support understanding of aggregate DER performance.
9. Recommendations to the adoption of IEEE Std. 1547-2018 to ensure necessary state regulators and policymakers clearly understand the needs for BPS reliability.
10. Educational materials, workshops, webinars, etc., that can be used for a range of audiences that describe any potential emerging risks and possible solutions to address these risks.
11. Other tasks as deemed appropriate.

## **Membership**

The SPIDERWG will include members who have technical or policy level expertise in the following areas:

- Modeling and or implementing aggregate DER in BPS planning studies and for real-time operations
- Assessing the reliability impacts of increasing penetration of DER on the BPS
- Load forecasting and load modeling with the inclusion of DER
- IEEE Std. 1547-2003 and IEEE Std. 1547-2018

The SPIDERWG will consist of a chair and vice chair appointed by the PC leadership. NERC staff will be assigned as Coordinator(s). Decisions will be consensus-based of the membership, led by the chairmen and staff coordinators. Any minority views can be included in an addendum.

## **Reporting & Duration**

The SPIDERWG will report to the NERC PC. SPIDERWG work products will be approved by the NERC PC. The group will submit a work plan to the PC following its inception, and will develop the deliverables outlined.

## **Meetings**

The group is expected to have two to three in-person meetings, supplemented with conference calls to continue workload throughout the year.

*Approved by the NERC Planning Committee on December 12, 2018.*