

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

Scope Document
March 2023

Purpose

Historically, 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, operating, modeling, and reliability impacts to the Bulk Power System (BPS). This effort furthers the work accomplished by the NERC Distributed Energy Resources Task Force¹ (DERTF) and the NERC Essential Reliability Services Task Force/Working Group² (ERSTF/ERSWG), and addresses some of the key goals in the ERO Enterprise Operating Plan.³

Activities

The NERC SPIDERWG will serve as a stakeholder forum for focusing on DER from a transmission planning, transmission operation, 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 Reliability and Security Technical Committee (RSTC) and its subcommittees, working groups, and task forces, as necessary, to complete its work plan. 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 of the BPS⁴ 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.

¹ DERTF Final Report available here:

https://www.nerc.com/comm/Other/essntlrlbltysrvctskfrcdl/Distributed_Energy_Resources_Report.pdf

² ERSTF/ERSWG Framework Report available here:

<https://www.nerc.com/comm/Other/essntlrlbltysrvctskfrcdl/ERSTF%20Framework%20Report%20-%20Final.pdf>

³ The ERO Work Plan priorities are available here: <https://www.nerc.com/AboutNERC/Pages/Strategic-Documents.aspx>

⁴ This may include Essential Reliability Services, 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. 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
9. Coordinate with NERC and the MOD-032 Designees to develop processes to include DER in future Interconnection-wide base cases consistently.
10. Coordinate with simulation software vendors to seek consistent implementation of DER models in steady-state powerflow and dynamic simulations.
11. Provide assistance to NERC Event Analysis evaluations of BPS disturbances when aggregate DER are involved in the disturbance, as necessary
12. Provide guidance on impacts that higher penetration of DER may have on transmission system operations, and the potential solutions or recommended practices to overcome any identified issues.
13. 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.

Deliverables

The SPIDERWG will develop technical reference documents, guidelines, and other educational materials to support industry efforts in BPS planning and operations under higher penetrations of DER. The SPIDERWG will keep an updated work plan on its website that includes, but is not limited by, the following:

1. Assessment of DER performance and event analysis (possible industry survey) and aggregate DER impacts, including expected projections of penetration level and other relevant impacts.
2. System planning and reliability impacts that aggregated DER can have; focus on study approaches and potential solutions to these impacts.
3. Data collection and information sharing with respect to DER penetration levels and necessary information for BPS planning and system operation.
4. Improvements to DER modeling and model benchmarking.
5. Recommendations to software vendors on DER modeling consistency, including any recommended improvements to software platforms (coordinated with the software vendors) to gain this consistency.

6. Recommendations to the MOD-032 Designees on inclusion of DER in Interconnection-wide base cases, including recommendations on the dispatch and case setup for various scenarios of DER.
7. Recommendations for distribution system monitoring to support understanding of aggregate DER performance.
8. Recommendations on the adoption of IEEE St. 1547-2018 to ensure necessary state regulators and policy makers clearly understand the needs for BPS reliability.
9. 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.

SPIDERWG will maintain its work plan to include completed, canceled, tabled, and ongoing tasks that accomplish tasks from its initial work plan, RSTC assignments, and other scoped work.

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 St. 1547-2003, IEEE Std. 1547-2018, and related equipment standards

The SPIDERWG will consist of a chair and vice chair appointed by the RSTC leadership. NERC staff will be assigned as Coordinator(s). Decisions will be based on the consensus of the attending membership, led by the chair and staff coordinator(s). Any minority views can be documented as appropriate.

The SPIDERWG chair, vice chair, and the assigned NERC staff coordinator can develop subgroups that the SPIDERWG membership may join to contribute to the development of deliverables identified in the work plan.

Reporting & Duration

The SPIDERWG will report to the NERC RSTC. The NERC RSTC will approve current and future SPIDERWG work products. The group will develop the deliverables in its work plan on a timeline approved by the RSTC and will continue until completion of the SPIDERWG work plan.

Meetings

The group is expected to have four meetings per year, supplemented with subgroup conference calls, to facilitate the completion of work products.

Approved by the Reliability and Security Technical Committee on Month Day, Year