• **Background from 2017 LTRA on DER**
  
  - Estimated addition of more than 26 GW of non-utility photovoltaic (PV) that will be added NERC-wide by 2027
  
  - Indicated that neglecting to monitor (model, plan, analyze, forecast, and observe) for higher levels of penetration of DER can lead to unexpected aggregated impacts on areas of the BPS and begin to affect operations.

  ![DER Drivers Chart](chart.png)
• March 7, 2018 PC DER Brainstorming Session Key Points
  ▪ 41 topics/issues relating to DER in the industry
  ▪ DER Topics Categorized as: Administrative, Definition, Education, Jurisdiction, Modeling, Monitoring, Performance, and Standards
  ▪ PC members to rate (1-10 scale) the issues by NERC priority
  ▪ PC members asked to assign the issue to NERC PC Committees

• SAMS Chairs provided feedback to PC as follows:
  ▪ 22 topics related to SAMS scope of work (Modeling and Performance)
  ▪ 13 topics were outside the PC Scope or NERC Jurisdiction
  ▪ 3 topics related to SPCS (Performance relating to protection and controls)
  ▪ 2 topics related to PCEC (Jurisdiction, Education, and Definition)
  ▪ 1 topic related to SMS (Performance relating to system phase disparity)
LMTF & SAMS Discussion
Tentative Task Force/ Working Group Concept
• Reporting: NERC System Analysis and Modeling Subcommittee

• Purpose: Task force/Working Group that focuses on planning assessments and modeling in order to assess the aggregated impacts of DER on the BPS.

• Proposed Activities:
  ▪ Focus on DER from a planning perspective and produce technical documents and/or guidelines for BPS planning.
  ▪ Improve DER modeling practices: data collection, model improvements or new aggregate models, load forecasting (with the LMTF).
  ▪ Identify and quantify the effects of aggregated DER to BPS system planning assessments (i.e. steady-state, dynamic, transient).
  ▪ Produce industry workshops and webinars to increase industry knowledge of the reliability impacts of aggregate DER on the BPS.
• Expand interconnection-wide models with aggregate DER generator models at the Transmission and Distribution (T&D) Interface.
  ▪ Focus on pragmatic application guidance and software improvements to get aggregate DER models (der_a) added in planning studies more effectively.

• Survey the industry use of NERC DER planning models, dynamic load models and DER modeling guidelines.
  ▪ Use the survey results to advance these modeling applications and to highlight the need for software improvements.

• Create a technical reference document explaining aggregate DER performance characteristics and methods to quantify their impact to reliability for BPS planning assessments.
  ▪ Identify and quantify the impacts of aggregate DER (high penetration levels of DER) at the T&D interface and describe impacts to BPS reliability
  ▪ Focus on aggregate performance characteristics under abnormal system conditions (E.g. Impacts to UVLS/UFLS, Blackstart and Restoration, etc.)
• Develop guidelines to address coordination requirements in order to exchange aggregate DER data with sufficient detail on capability and performance between BPS and distribution system entities.
  ▪ Facilitate data collection efforts and propose recommendations for uniform accounting of DER, any needs for data collection improvements and guidance for uniform tracking (controllable and uncontrollable) and monitoring (offline and online) DER.

• Provide a recommendation for assessing BPS reliability and/or operational impacts of aggregate DERs in NERC’s Long-Term Reliability Assessment (LTRA) and other assessments.

• Host an industry workshop/webinars with industry on aggregate DER and PIDER activities.
• **Administration**: Reports to NERC SAMS
  - Scope is approved by the Planning Committee (PC)
  - Work products are reviewed by the SAMS
  - Work products are approved by the PC (and OC if required)

• **Organizational Structure**: Chair, Vice Chair and NERC Staff Member
  - Chair and Vice Chair are appointed by SAMS Chair for 2 year term
  - Chair to periodically provide status updates on group activities to: SAMS, PC (and OC as appropriate)

• **Group Duration**: 2 calendar years (minimum)

• **Meetings**: 4 in-person meetings per year
  - Supplemented with conference calls as needed
Next Steps & Discussion

• Seek Approval and Consensus for: PIDER group
  ▪ Should the group be a task force or a working group?
  ▪ SAMS Chairs assist with assigning PIDER leadership
  ▪ Agree to a schedule for in-person meetings

• Request review straw-man proposal: PIDER scope of work
  ▪ Cutoff date for feedback: Friday, June 8, 2018 COB ET

• Next Steps:
  ▪ Ask PC for PIDER group approval at PC Meeting
  ▪ Send out email to the industry requesting participation

• Open Discussion
Questions and Answers

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Appendix Slides
NERC ERO Operating Plan:
Goal 3: Key Activities

- Addressing key contributing activities of the NERC ERO Operating Plan
  
  **Goal 3: Reduction of Known Risks to Reliability**
  
  - Gather additional system performance data (e.g., data on balancing and frequency performance, renewables, and ERS) to advance analytics and improve modeling
    - Collect aggregated DER performance data to build and benchmark industry aggregate DER generator models.
  
  - Ensure interconnection-wide models are of high quality and fidelity.
    - Expand the models to include aggregate DER generator modeling data.
  
  - Collaborate with Planning Coordinators to expand development of interconnection-wide models with expected dispatches to support effective long-term planning assessments.
    - Identify the type and periodicity of information needed from aggregated DER to improve load forecasting and expected generator dispatches to be included in the long-term planning assessments.
  
  - Develop a guideline for industry use in addressing data modeling and information sharing.
• Addressing key contributing activities of the NERC ERO Operating Plan

  **Goal 4: Identification and Assessment of Emerging Reliability Risks**
  
  o Identify risk-based data needs, collection, analysis, and modeling technology to assess the impact of emerging risks, including distributed energy resources, on planning, operations, and restoration and recovery, incorporating the identification of data and information-sharing needs.
  
  o Augment data collection and insights into distributed energy resources and their potential impact on the BPS. Identify the type and periodicity of information needed from distributed energy resources to improve load forecasting, generator modeling, and situation awareness. Address coordination requirements between BPS and distribution system planners and operators to account for the uncertainty introduced by integration of variable generation, including the impact of weather on these resources.

  o Provide independent technical assessments of the reliability impacts from the changing resource mix driven by proposed state, provincial, or federal statutes and transmission provider tariffs.

  o Educate policymakers, regulators, and industry and other affected stakeholders on the reliability effects associated with emerging reliability risks.