Attachment #8.1
Return to Agenda

DER Report For NYSRC Executive Committee Meeting 7/10/20

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The July edition of the DER Report is focused primarily on NERC IRPTF activities and presentations in June:

NERC IRPTF	White Paper:	BPS-Connected Inverter-Based Resource Priorities
	Presentation:	Southwest Power Pool (SPP) Inverter-Based Resource Integration
	Teleconference:	Inverter Based Resource Performance Task Force Meeting 6/2-3/20
	Webinar:	BPS Connected Inverter-Based Resource Modeling and Studies Based on the Technical Report published and referenced from last month
NPCC RSC	Document:	2021 Business Plan and Budget
NERC SPIDERWG		No activities or reports published over the past month

Wherever possible, direct links to the documents, presentations and websites have been provided for further inquiry.

NERC Planning Committee: IRPTF (inverter-Based Resource Performance Task Force)

- BPS-Connected Inverter-Based Resource Priorities (White Paper). The first part of this paper provides a list (with links) to recently published Disturbance Reports, Reliability Guidelines and other IRPTF White Papers.

  The second part published the results of a two-question survey taken in June, asking 75 member participants to prioritize a list of existing and future areas of investigation for the IRPTF Task Force. The 5 highest-ranked action items of 10 were:
  1. Reliability Guideline: BESS and Hybrid Plant Performance, Modeling, and Studies
  2. Reliability Guideline: EMT Modeling and Simulation
  3. Follow-Up and Tracking: Positive Sequence Modeling Issues
  4. Technical Report: Energy Transition to High IBR Penetrations
  5. White Paper: TP/PC Stability Criteria in High IBR Penetrations

  It was noted that the top four work items were currently underway within the Task Force.

  An open-ended question followed, asking for future areas of interest. The top 5 suggestions out of 11 were:
  1. Recommended performance of power oscillation damping controls for inverter-based resources and recommended ways to develop interconnection requirements around these controls.
  2. Modeling, screening studies, and detailed simulation methods for studying potential risks of subsynchronous control interactions and subsynchronous resonance with increasing penetrations of inverter-based resources.
  3. Guidance around inverter-based resource commissioning and model development/validation during and after plant commissioning.
  4. More detailed guidance and case studies regarding modeling, studies, and performance requirements in areas of low short-circuit strength.
  5. Standardized inverter controls and capabilities.

- Inverter-Based Resource Integration (Presentation): This EPRI study sponsored by Southwest Power Pool (SPP) evaluated grid strength (as measured by voltage response to disturbances) as related to grid stability, due to increasing wind penetration (now on the order of 72%). SPP covers a large geographic area, and is concerned that large concentrations of Wind Resources in areas remote from load centers could result in localized weak grid conditions, leading to instability issues. The study looked at the aggregate behavior of inverters, to evaluate the potential for "Inverter Oscillatory Instability" that could lead to negative damping and system instability, with sustained inter-area oscillations. In the study, weak grid areas were identified using EPRI's Grid Strength Assessment Tool (GSAT). Potential instabilities were evaluated using PSCAD (an Electro-Magnetic Transient Program or EMTP tool) was used to identify the extent of stability. Mitigation efforts combined the adjustment of Critical Clearing Times with Inverter Control adjustments (gain settings for Phased-Lock Loops) to

successfully dampen the oscillatory responses to disturbances. As follow-up, SPP is looking to develop and enhance their EMTP analytical capabilities to better anticipate and respond to grid challenges as they evolve.

- BPS Connected Inverter-Based Resource Modeling and Studies Presentation and Webinar (110 Minutes):
  This presentation on BPS Connected Inverter-Based Resource Modeling and Studies was based on the Technical Report published in late May and referred to in the previous monthly report. Ryan Quint along with other presenters from CAISO, SCE, EPRI, Electranix and ERCOT help to distill the details of the report, focusing on the challenges for establishing consistent and accurate models of IBR behavior under dynamic and stressed conditions.

- Teleconference: Inverter Based Resource Performance Task Force Meeting (Agenda / Presentations)
  This 2-day Webex conference covered a variety of topics regarding IBR performance and control. The Task Force's Work Plan Objectives, which form the structure and goals of the IRPTF, were reviewed and discussed. All of the presentations are contained within a single 240-page document in the above link.
  Highlights include:
  - ERCOT: IBR Requirements Update, Presentation on damping and model validation requirements
    - Synchronous generators with power system stabilizer (PSS) provide damping to the system oscillation in the range of 0.2-2 Hz.
    - Under high renewable output conditions, limited/no synchronous generators in west Texas lead to insufficient damping support needed to maintain stability during and after the disturbances.
    - There is an Increasing need of damping support to maintain acceptable dynamic responses with high renewable power transfer
  - EPRI: Looking for utility participation in 2 new projects:
    - Inverter-Based Resources Modeling and Model Validation Using Field Measurements with Focus on Bulk Power System Impact
    - DER Dynamic Response Characterization for Protection, Planning, and Power Quality
  - NERC SPCS: Impacts of Inverter-Based Resources on Existing Protection Systems
  - ISONE, CAISO - Battery Energy Storage System and Hybrid Resource Modeling and Studies
  - IRPT - Energy Transition towards High Penetrations of Inverter-Based Resources
  - REPlant: Technical Presentation: Voltage Stability on Weak Grid
  - ERCOT: West Texas and Panhandle Stability Studies
  - ATC: Technical Presentation: Incorporating EMT Studies into the Generator Interconnection Process
  - Electranix-National Grid: 730 MW DG EMT Study

NPCC Business Plan and Budget Approved and Submitted to NERC

NPCC's 2021 Business Plan and Budget (Link) was approved by their Board of Directors, and submitted to NERC on June 24th. DER-Related activities received mention in several areas including modeling and monitoring. Specific Goals related NPCC's Regulatory/ Governmental Affairs Advisory Group indicated that 21% of staff time associated with Reliability Assessment and Performance Analysis (RAPA) would consist of:

- Continued outreach to NPCC's state electricity and environmental regulators stressing the importance of understanding and considering reliability impacts during the development of State/Provincial initiatives (such as the identified Essential Reliability Services, Distributed Energy Resource integration).
- Focus on initiatives concerning regional planning, distributed energy resource requirements, the timing of new generation resources and transmission infrastructure projects.