**IBRWG Report To ROS**

**March 2024**

**Chair: Julia Matevosyan, Vice-Chair: Miguel Cova Acosta**

**IBRWG met on March 8th (Webex, Open Meeting).**

**Advanced Grid Forming for Utility Scale BESS**

Presented by Frank Berring (SMA)

* + Grid forming technology unlocks new capabilities/services from BESS.
  + These can be split into “basic” and “advanced” capabilities.
  + These capabilities are factored into GFM BESS design and operation.
  + Showed comparison of capabilities between SynCon, GFL BESS and GFM BESS.
  + No incentive today for BESS to be GFM!
  + Discussed success of the Stability Pathfinder Tender in Great Britain, as a way to deploy GFM capability.

**Data Recording Capabilities at IBR Plants (SMA)**

Presented by Scott Karpiel (SMA)

* + Inverters have the capability of recording oscillography; however the sampling rate needs to be slower.
  + This will aid in the analyses of the inverter’s behavior during events.
  + Does not have to be every IBR Unit, but IBR Units that are furthest 10% of each collection circuit for each model of inverters (Aligning with PRC028-1).
  + Discussed SMA inverter capability to store onboard oscilloscope data and showed some examples.
  + It should be required for data to be exportable in a universal format to ensure the data is easily retrievable and usable for fault analyses and aligning with other standards.
  + Discussed capabilities of SMA inverters to comply with IEEE2800 Measurement Data and Measurement Accuracy requirements. Some data needs to be pulled to ensure required retention, but otherwise SMA inverters meet or exceed the requirements.

**GFM BESS – Developer’s Perspective**

Presented by Amit Barnir (Zenobe)

* + Zenobe is a BESS developer with specific interest in GFM
  + Zenobe got awarded three BESS GFM projects in Great Britain’s Stability Pathfinder Tender, Phase 2. The first project is expected to be operational in Q4 of 2024.
  + Discussed the need for transparency and understanding of limitations.
  + Reviewed and compared six SynCons proposed in West Texas with GFM BESS as an alternative.
  + GFM BESS could have been an attractive alternative: effective at providing inertia, fault current and dynamic voltage support, < 2 years build time, highly cost competitive.
  + “Stability” benefits of a GFM BESS are stackable with energy services (while SynCon is there just for grid support). Showed an example of comparable GFM BESS solution.
  + Advocated for locational procurement of stability services rather than a requirement for all future BESS to be GFM.

**Odessa Events Follow-Up Efforts**

Presented by Patrick Gravois (ERCOT)

* + Provided an update of what was done at IBR plants involved in two Odessa events, by inverter manufacturer and by plant.
  + TMEIC:
    - Identified and implemented corrective actions for all causes of tripping that affected their inverters (PLL loss of synch, voltage phase angle jump, AC overvoltage and overcurrent).
    - 28 facilities with TMEIC inverters (not involved in Odessa events) were followed up with and instructed to make appropriate evaluations/changes. 11 facilities are done, others are work in progress.
    - All new projects will have up-to-date firmware with recommended settings.
  + Power Electronics:
    - Issues identified in facilities were not as systemic as those with TMEIC inverters. Work in progress with some improvements.
    - 18 facilities with Power Electronics inverters (not involved in Odessa events were instructed followed up with and instructed to make appropriate evaluations/changes. 16 facilities are done, others are work in progress.
    - All new projects will have up-to-date firmware
  + KECO
    - Poor logging capabilities and lack of OEM support
    - Fixes are slow and individual for each plant, but some marginal improvements have been made.
    - Only 4 additional facilities with KACO inverters exist in ERCOT that have not been involved in previous events.

**Update on 3 Recent South Texas Disturbance Events**

Presented by Patrick Gravois (ERCOT)

* + Three events in Nov, Dec & Jan where normally cleared faults was followed by large temporary reduction (about 450-900 MW) of wind generation during fault and small post-disturbance loss of generation (about 30-100 MW)
  + ERCOT presented details of each of the three events.
  + ERCOT is following up with plant owners and OEMs involved trying to understand:
    - Why is there such a large MW loss immediately after a shallow voltage dip fault?
    - What can be done to prevent such a large loss of active current immediately after the fault?
    - Is this expected performance based on provided models?

**DWG and IBRWG Collaboration**

**Initial Ideas from Modeling Guide Update**

Presented by Jonathan Rose and John Schmall (ERCOT)

* + Focused on VRT and the test profiles to be applied.
  + Assumed that there will be requirements aligned with the IEEE 2800-2022 curves (but NOGRR 245 is not finalized)
  + Proposed to test the preferred LVRT curve as a series of voltage dips rather than single stair-step function (as done currently).
  + Proposed HVRT testing curve and
  + And transient HVRT Curve (in PSCAD)
  + Next steps will include:
    - Feedback and presentations from OEMs
    - SLG fault test for PSCAD models
    - Performance evaluation
    - Other tests, beyond VRT
    - Draft DWG Procedure Manual Language.