



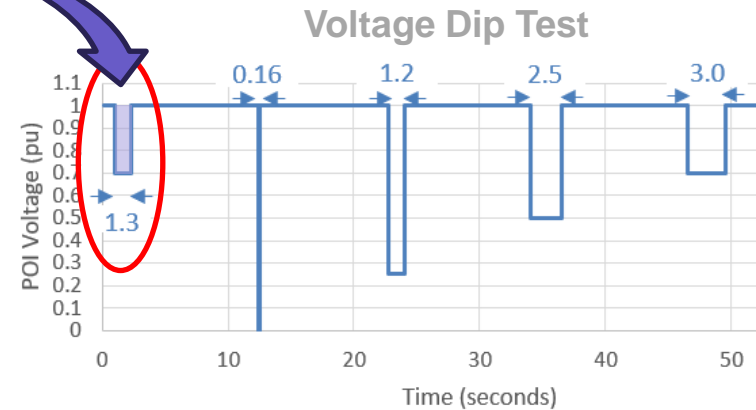
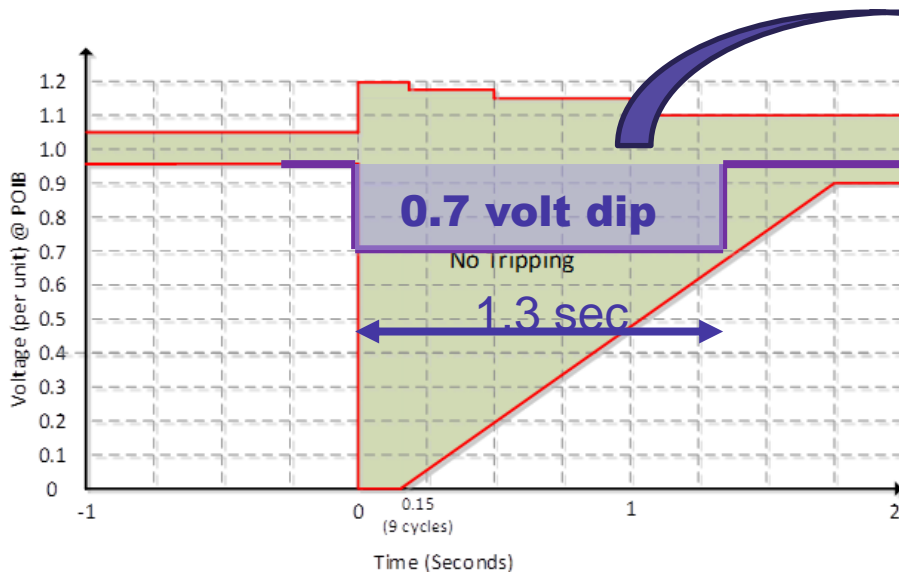
Updates to DWG Procedure Manual based on feedback from IBRWG stakeholders

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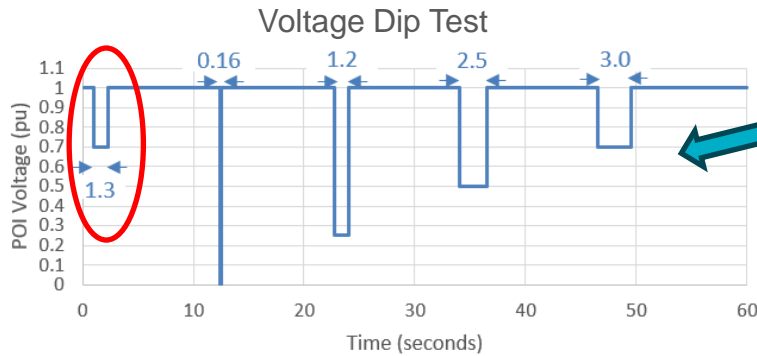
Summary – Minor DWG Manual Updates since July 12

1. Slightly modified “Preferred” test profiles to provide useful performance testing for Legacy facilities and renamed the profiles as “Voltage Dip” test profiles.
 - Based on feedback asking about applicability of “Preferred” test curves to older Legacy resources. For more info on this change, refer to the supplemental presentation posted with IBRWG August 9 meeting materials.
 - ERCOT is asking legacy units to also perform the voltage dip tests to understand real power performance under moderate voltage disturbances. Refer to NOGRR-245 section 2.9.1.2(4) which applies to legacy Resources.
2. Additional minor miscellaneous edits for clarity (see slide 4).

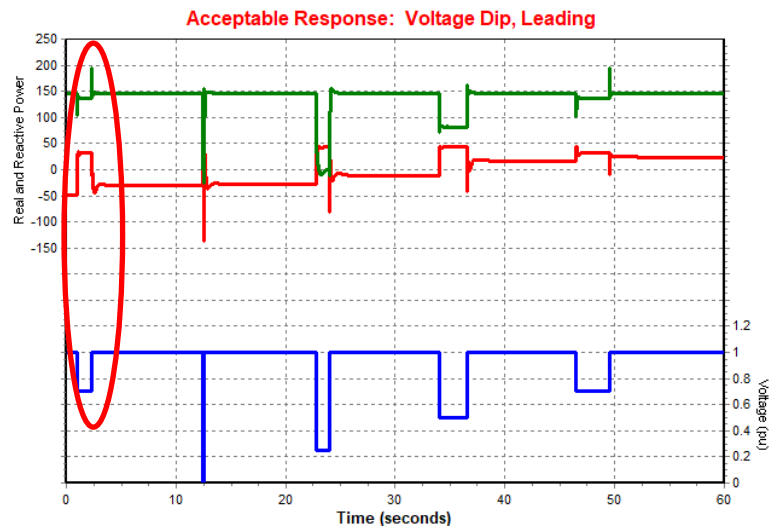


This dip is entirely within the Legacy VRT curve; thus, it is reasonable to expect legacy units to ride through the first dip.

Updated Plots and Language



- Refer to supplemental presentation:
 - Added an additional voltage dip of 0.7 pu and renamed the plots from “Preferred Test” to “Voltage Dip Test” to indicate that the same profiles should be used for both new and legacy Resources.
 - Example in DWG Procedure Manual is also updated.
 - Clarified DWG language criteria to match NOGRR-245 update to NOG 2.9.1.1.



When testing the “voltage dip” while, the following criteria applies:

- Resources not subject to the “preferred” Voltage Ride Through requirements of NOG 2.9.1.1 are only required to ride through the first dip of the below voltage dip profiles. This first dip is within the “legacy” LVRT requirements of NOG 2.9.1.2
- During the voltage dips:
 - The model shall inject active current for POI voltage dips of 0.5 and higher.
 - Injections of significantly reduced active current for voltage dips 0.5 pu and 0.7 pu should be accompanied by increased reactive current.
 - Reactive current injection at the POI shall be observable immediately or very shortly after a non-zero voltage dip is applied.
- After the voltage dips:
 - Real power should recover to full output within 1.0 seconds of POI voltage recovery to 1.0 pu.
- An explanation, including a reference to any exempt status per ERCOT Nodal Operating Guide Section 2.9.1, shall be provided for models which indicate that the unit trips or fails to meet any of the above performance criteria.

Miscellaneous Edits

3.1.5 Dynamic Model Quality Test Guideline

Submitted dynamic planning and operations models must be accompanied with results from model quality tests (MQT) performed by the facility owner as required in paragraph (5)(c) of Planning Guide Section 6.2. These results shall include the case simulation files as well as the simulation plots of relevant quantities for each test. When submitting PSS/E and PSCAD MQT files, include the leading and lagging power factor cases for the voltage ride-through tests. Guidelines on how these tests should be performed and the expected model performance are provided in the

- System Strength Test similar to Section 3.1.5.89.
- Voltage Angle Step Test as in Section 3.1.5.910.

3.1.5.4 Large Voltage Disturbance Test: (Low Voltage Ride-Through (LVRT) for IBRs, WGRs, and IBTEs)

All IBRs, WGRs, and IBTEs -and WGR plants should test two curves, both a "legacy" curve and a "preferred" curve as described in NOG 2.9.1. Testing both curves helps provide important model performance information. In situations where passing the "preferred" curve is not mandated by NOG 2.9.1, the "preferred" curve test must be run but will be considered for informational purposes regarding owner efforts to maximize capability.

Additionally, the maximized LVRT/HVRT capability as required in NOG 2.9.1.1(9) or 2.9.1.2(8) shall be demonstrated and documented in a format similar to the tables in NOG 2.9.1.1(1) or NOG 2.9.1.2(1).

- Added “*for the voltage ride-through tests*” to clarify that the leading and lagging MQT cases pertain only to VRT and hence do not pertain to synchronous facilities since these do not run a VRT test in their MQT (they run a fault test instead).
- Corrected a cross-reference section number on page 30.
- Removed references about demonstrating maximized capability.
 - Now, DWG manual only requests that REs document maximum capability in a table format. This is consistent with the requirements in NOGRR-245. (Search for the word “maximum” in NOGRR-245 to locate the relevant sections.)

Questions?



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