



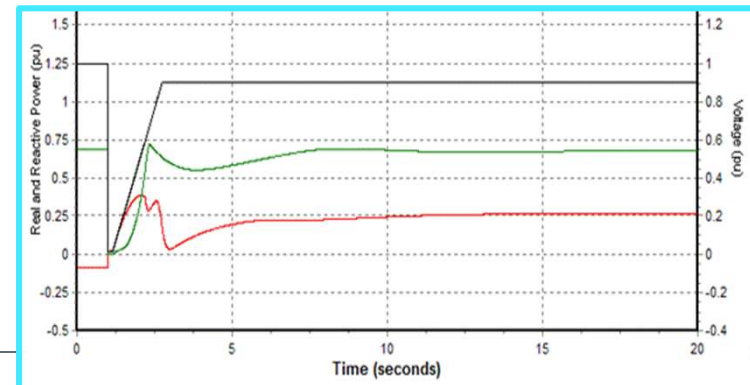
New Model Requirements and VRT Update

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Updated Modeling Requirements

- ERCOT requires the following models:
 - PSS/E version 33 and version 35 starting July 1, 2022
 - TSAT
 - PSCAD (for IBRs)
- Model Quality Test Reports are required for all new / updated models
 - PSS/E and PSCAD models
 - More info: Model Quality Guide at <http://www.ercot.com/services/rq/re>
- Tip: When running MOD 26/27, please also run the Model Quality Tests at the same time

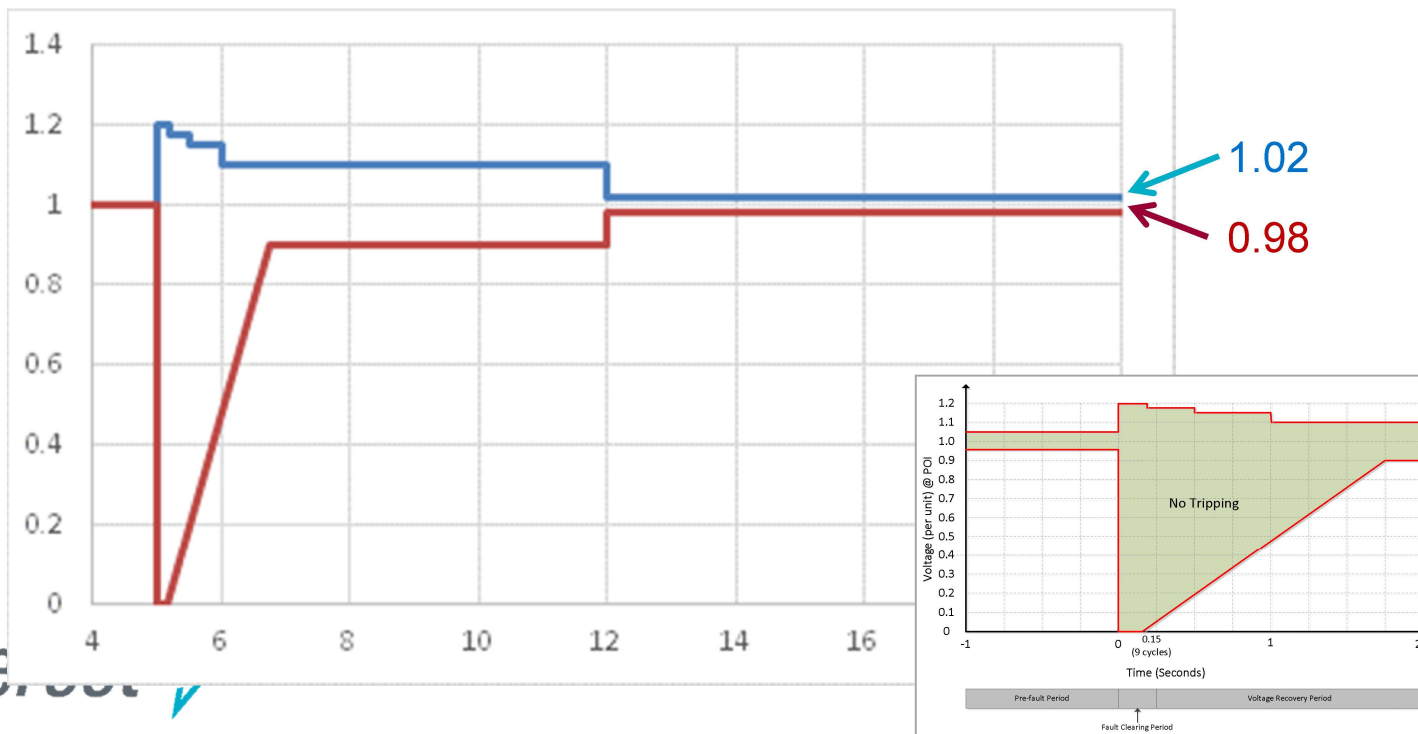


Voltage Ride Through Updates

- Background: VRT performance concepts originally presented at January 2019 RI Workshop
- This workshop:
 - Modified VRT profile
 - Clarity on requirements
- Applies to:
 - Model Quality Tests
 - FIS Stability Studies

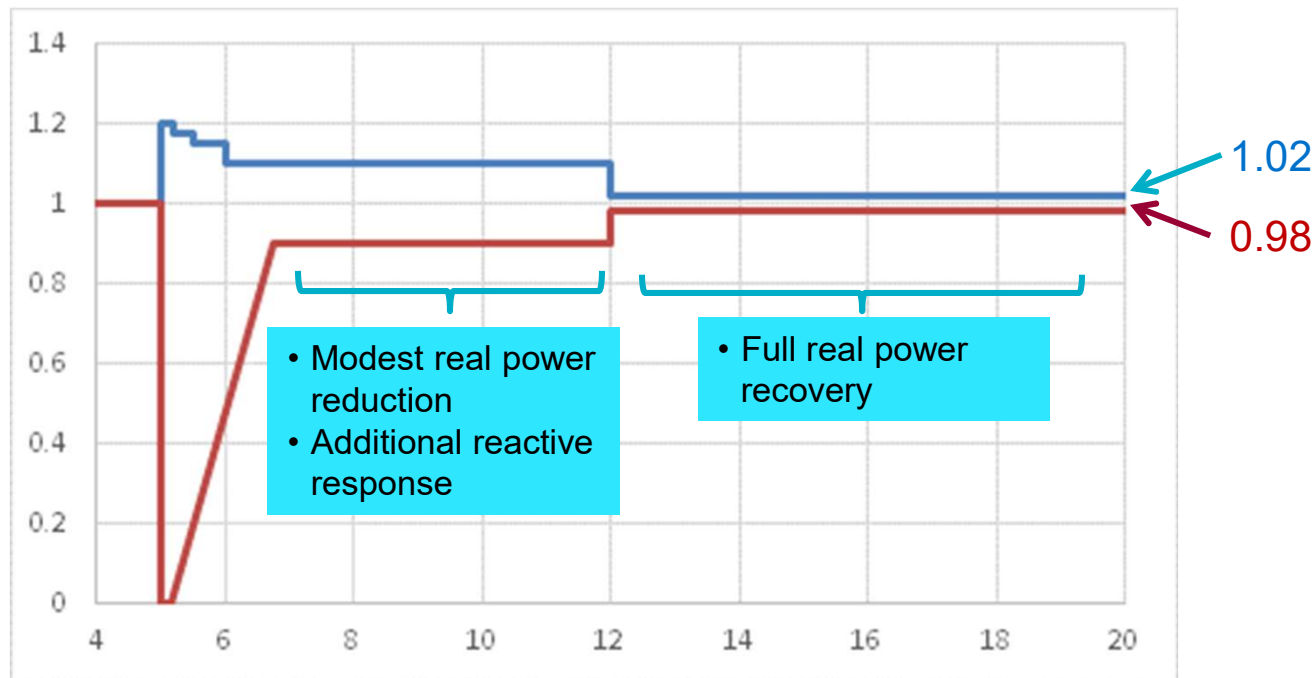
Introducing: Modified VRT Curve (optional)

- ERCOT is recommending use of slightly modified VRT curves
 - A final voltage step brings the voltage in the 0.98 – 1.02 range (see image)
 - Use of the new curves is optional. They are included in the latest version of [DMVIEW](#).
 - Actual VRT requirements haven't changed
- This new curve helps ERCOT evaluate real power recovery
 - May provide enough info for ERCOT to pass a marginal response



Evaluating Real Power Recovery

- The modified VRT curves will help ERCOT evaluate cases where the real power does not fully recover
 - A modest reduction in real power may be acceptable IF:
 - Reactive power response is beyond 0.95 power factor
 - Real power fully recovers when POI voltage is near nominal (e.g. 0.98 – 1.02)



Why is this being proposed?

- There are some situations where modest, temporary real power reductions can be a reasonable approach to hardware limitations
 - When the terminal voltage is low, inverter power rating might be reduced
 - Plant may be programmed to prioritize reactive power response
 - In an actual system, the POI voltage will respond to reactive power output. This will help bring the POI voltage closer to normal
 - The modified VRT curves provide a simple means to analyze this behavior
- Feedback from owners / manufacturers
 - Crafting requirements is a balance!

What is acceptable performance?

- **Dynamic Reactive** (*respond quickly to voltage*)
 - Nodal Protocol 3.15(3)(c)
 - Nodal Operating Guide 2.7.3.5 sections (2) thru (5)
- **No Momentary Cessation**
 - Nodal Operating Guide 2.9 (2)
- **AVR Response** (*regulate POI voltage*)
 - Nodal Protocol 3.15.3(4) and 3.15(4)
 - Nodal Operating Guide 2.7.3.5(4)

Additional details and examples of good performance can be found in the [DWG Procedure Manual](#) section 3.1.5.

Questions?

