Item 5.2.1: ERCOT Comments on NOGRR245

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Reliability and Markets Committee Meeting

ERCOT Public
June 17, 2024

Overview

- **Purpose**
  Describe significant risk to system reliability due to many ride-through failures by Inverter-Based Resources (IBRs) and Wind-Generation Resources (WGRs) and highlight issues in TAC-recommended version of NOGRR 245 needed to alleviate reliability risks as originally intended by NOGRR 245

- **Voting Items / Requests**
  ERCOT asks the Reliability and Markets (R&M) Committee to recommend the Board approve NOGRR 245 as modified by TAC in response to the Board remand

- **Key Takeaways**
  - IBR ride-through failures are widely recognized as a significant and increasing risk that could result in rapid collapse of part of or all the ERCOT System under common conditions
  - The Board remanded NOGRR 245 to TAC to address ERCOT reliability concerns and provide detailed reasons for its recommended version, including why TAC did or did not address ERCOT's key reliability concerns
  - The version of NOGRR 245 TAC recommends addresses most of ERCOT's concerns and ERCOT recommends the Board approve the TAC-recommended version of NOGRR 245

NOGRR 245 Remand Guidance

ERCOT presented the following reliability concerns and comments from the ERCOT Board meeting to TAC - NOGRR 245 should:

- Provide clarity and require maximizing ride-through capability to equipment capabilities and not just to meet minimum performance requirements
- Modify the exemption process:
  - Allow ERCOT to include system reliability impacts when considering exemptions
  - No exemptions for unknown capabilities, phase angle jump or rate-of-change-of-frequency uncertainties
  - Provide objective, repeatable criteria for cost thresholds for physical upgrades
  - Maintain clear performance requirements during the exemption and appeal process
  - Give ERCOT sufficient time to review exemption and extension requests
- Allow one-time exemption process and not allow continued lowering of requirements through subsequent exemptions
- Require mitigation of performance failures
- Require new IBRs be designed and use capabilities of modern IBRs to improve reliability
- Maintain existing voltage ride-through performance requirements when higher than IEEE requirements

NOGRR 245 Modifications After Remand

- Require maximizing ride-through to full equipment capability and not just meet minimum performance requirements
  - Ensure language consistently requires maximizing to equipment limitations vs. merely meeting minimum performance requirements

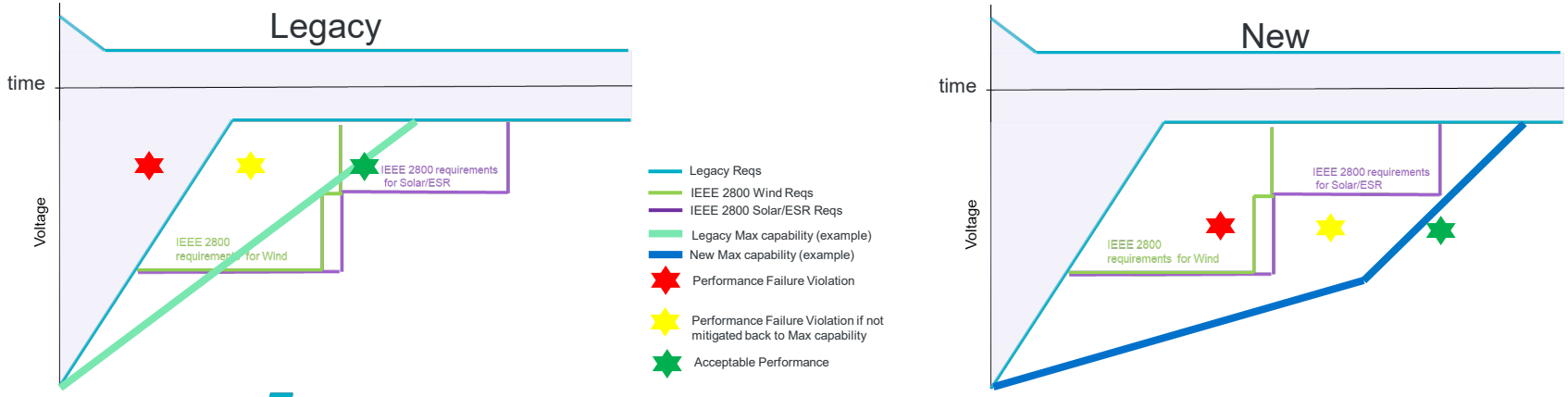
- Modify exemption process
  - Clear criteria for when exemption presents unacceptable system reliability risk, including unknown capabilities, phase angle jump or rate-of-change-of-frequency uncertainties [Section 2.12.1 (4)(a)]
  - Clear criteria requiring implementing all available software, firmware, setting and parameterization changes prior to allowing exemption [Section 2.12.1(4)(b)]
  - Bright-line cost criteria for physical modifications to comply with performance requirements [Section 2.12.1(4)(c)]
  - During exemption/extension/appeal process, performance requirements are greater of documented maximum capability or performance requirements on 5/1/24 [Section 2.12.1(11)]
  - Modified timelines to accommodate potentially large number of exemption requests and provide ERCOT time to respond [Sections 2.12.1.3 and 2.12.1.4)]

NOGRR 245 Modifications

- Do not allow continued lowering of requirements through additional exemptions
  - Removed allowance for new exemptions and lowering requirements after performance failure [Section 2.13 (5)]
  - Require mitigation of all performance failures [Section 2.13 (5)]
- New IBRs must be designed to and use capabilities of modern IBRs to improve reliability
  - Maximize performance of protection systems, controls, and other plant equipment (w/n equipment limitations) to achieve, as much as reasonably possible, IEEE 2800-2022 performance [Section 2.9.1 (8)]
- Maintain existing voltage ride-through performance requirements when higher than IEEE requirements
  - Ensure voltage ride-through performance requirements below .25 p.u. for new IBRs match current requirements
- Other changes for consistency and clarity
  - ERCOT comments make additional changes for consistency and clarity

NOGRR 245 Key Compromises

- **Moved effective date for new IBR requirements from 6/1/23 to 8/1/24**
  - ERCOT was concerned that ~25 GW of new, more capable IBRs would not have to perform to IEEE 2800-2022 requirements if date delayed as proposed
    - Many other regions already adopted IEEE 2800-2022 during 18+ months of NOGRR 245 process
  - Allowing later date while addressing reliability risk, revised TAC version requires:
    - Maximizing IBR performance must include trying to meet/exceed IEEE 2800-2022 requirements up to equipment limitations
    - For performance failures below modeled max capability (but above min performance requirements), IBRs must mitigate back to modeled maximum performance capability



NOGRR 245 Key Compromises

- Puts exemption requirements with criteria for ***physical*** improvements to meet legacy requirements in gray box [Section 12.1(4)(c)]
  - ERCOT proposed clear/consistent/objective cost criteria to determine when to require available physical improvements under exemption process
  - Some opposed cost criteria and proposed not requiring *any* physical modifications
  - TAC compromised by putting criteria in gray box until 3/1/25 to allow NOGRR 245 to proceed and encourage Resource Entities to submit new NOGRR to provide *different* clear/consistent/objective criteria before 3/1/25

Key Takeaway: While ERCOT continues advocating for a 6/1/23 effective date for new requirements, ERCOT can support compromise to allow NOGRR to proceed

Immediate Action Begins Decreasing Reliability Risk

- ERCOT issued Market Notice on 5/1/24 encouraging Resource Entities to maximize IBR/WGR ride-through capabilities by implementing available software upgrades and parameter changes
  - Consistent with NERC recommendations beginning as early as 2018
  - Must follow Planning Guide Revision Request 109 to ensure change occurs and ERCOT reviews Resource model prior to implementation
  - Resource Entities w/ IBRs/WGRs must report plans (w/ implementation schedule) by 8/1/24 for protection system, software, firmware, parameter and control changes to maximize ride through capability to equipment capability
  - ERCOT will compile responses and report results at August R&M meeting

Key Takeaway: ERCOT continues to encourage IBR owners to immediately take actions to reduce risk from ride-through failures.

NOGRR 245 – ERCOT Recommendations

- ERCOT appreciates substantial work by Market Participants and committees to bring a balanced set of compromises and create framework to reduce reliability risk associated with many IBR/WGR ride-through failures
- Additional substantive changes to IBR ride-through requirements should be made in a new NOGRR unless needed for reliability
- ERCOT recommends the R&M Committee recommend Board approval of NOGRR 245 as recommended by TAC at 6/7/24 TAC meeting

Key Takeaway: ERCOT recommends the R&M Committee recommend the Board approve NOGRR 245

Questions?

Appendix

Appendix

Links to previous applicable ERCOT NOGRR 245 presentations:

- April 22 R&M Committee meeting - *4.2.1 ERCOT Comments on NOGRR 245.pdf*
  - https://www.ercot.com/files/docs/2024/04/15/4.2.1%20ERCOT%20Comments%20on%20NOGRR245.zip
- June 7 TAC Meeting - *ERCOT NOGRR 245 060724 Special TAC meeting.pptx*
  - https://www.ercot.com/files/docs/2024/06/07/NOGRR245%20Special%20TAC%2020240607.zip