EPE's Comprehensive Approach to Meeting ERCOT NOGRR-245 Compliance

Background

A large-scale wind project required an evaluation to ensure compliance with ERCOT NOGRR-245 ride-through standards, which require generators to continue to exchange current with the grid during ERCOT-specific frequency and voltage disturbances and extend the equipment ride-through capability to its maximum.

The facility has numerous turbines feeding into the grid and needed to prove it could handle frequency and voltage disturbances.

The client looked to EPE to perform a comprehensive ride-through assessment. EPE's deep modeling and compliance expertise ensured a rigorous evaluation process to address all technical and regulatory requirements.

Challenge

Meeting ERCOT's rigorous NOGRR-245 ride-through standards requires various areas of expertise, which include EMT modeling, protection system coordination and familiarity with ERCOT and equipment OEMs. Fortunately, EPE has a stellar team built for this and has developed the best approach to this process.

Some of the variables the team needed to consider included:

Model Accuracy: Ensuring the accuracy of the site's PSCAD model to simulate realistic grid disturbances.

Equipment Settings: Ensuring the true maximum equipment ride-through capability is used, and substation equipment protection settings are coordinated.

System Optimization: Balancing ride-through control and protection settings to allow optimal ride-through performance while protecting equipment from potential damage.

The EPE team set out to deliver a comprehensive evaluation that provided actionable recommendations for achieving compliance while considering the practical limitations of the site equipment.

EPE'S COMPREHENSIVE APPROACH TO MEETING ERCOT NOGRR-245 COMPLIANCE

Approach

EPE adopted a structured methodology to assess and enhance the project's compliance with NOGRR-245 standards:

PSCAD Model Updates: Updated the as-built PSCAD model to include turbine and inverter protection settings at maximum equipment capabilities and integrated substation frequency and voltage protection settings.

Simulation Testing: Conducted transient simulations in PSCAD using the NOGRR-245 frequency and voltage ride-through profiles. These simulations evaluated the system's response to various disturbance scenarios at the point of interconnection.

Performance Assessment: Assessed the simulation results against ERCOT's requirements, ensuring compliance with voltage and frequency ride-through curves.

Setting Optimization: Fine-tuned both PPC and turbine ride-through control settings and suggested substation protection settings to ensure optimal ride-through performance and proper protection coordination.

Outcome

EPE's evaluation successfully identified areas for improvement and provided actionable recommendations to enhance the site's compliance with ERCOT NOGRR-245 standards.

The updated PSCAD model and protection settings aligned the site's capabilities with ERCOT's ride-through requirements, while EPE's recommendations, such as adjusting relay settings and consulting OEMs, offered a clear roadmap for achieving full compliance. The project's ability to ride through voltage and frequency disturbances was significantly improved, minimizing the risk of unnecessary disconnections.

By working closely with the client and addressing critical challenges, EPE enabled the project to achieve its compliance goals and optimize system performance. The project is now positioned for long-term success, with improved reliability and readiness to support growing demands on the grid.

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