

EPE Ensures NERC PRC-019 and PRC-024 Compliance for IBR Plants

Background

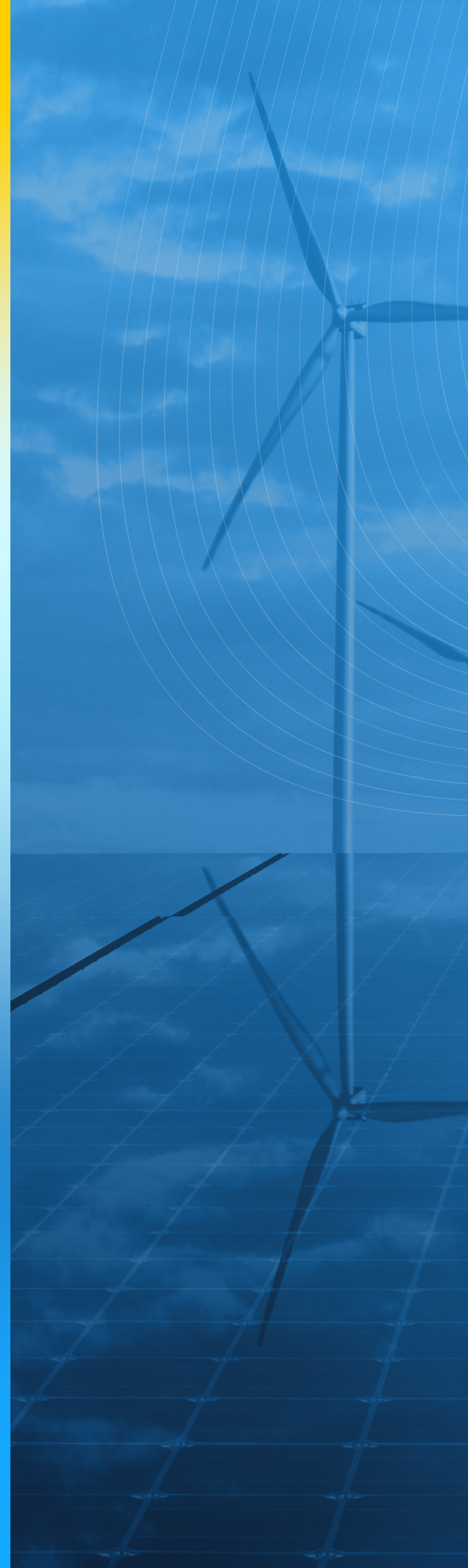
A large renewable energy project in Central California set out to combine solar power and energy storage to support the state's clean energy transition. The renewable project comprises 51 solar inverters and 39 storage inverters and generates a total capacity of 219.3 MVA for solar and 163.8 MVA for energy storage.

The project needed to comply with NERC's PRC-019-2 and PRC-024-3 reliability standards, which ensure generating units remain connected during voltage and frequency disturbances. To manage these complex technical challenges, the project manager enlisted EPE to conduct comprehensive compliance studies and ensure the project met all regulatory requirements, leveraging the team's extensive experience in navigating the energy regulatory landscape and NERC standards

Challenge

Integrating large-scale solar and battery storage presents unique challenges, especially in maintaining stable voltage and frequency. For this project, compliance with NERC PRC-019-2 and PRC-024-3 wasn't just about meeting regulatory standards — it was about ensuring the system could handle real-world grid fluctuations. Protection controls had to be finely tuned to prevent equipment damage during extreme events while avoiding unnecessary shutdowns that could disrupt operations and impact grid stability.

EPE's task was to find this balance and configure settings to be sensitive enough to respond to significant changes yet stable enough to keep the system online whenever possible. The EPE team's multi-faceted understanding of the grid, from a physical, economic and regulatory perspective, made them the right partner to see this project through to success.





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Approach

EPE began with a comprehensive evaluation of the project's existing control and protection settings, assessing voltage and frequency ride-through capabilities. Critical steps in this process included:

Coordination Review: Under the NERC PRC-019-2 standard, EPE evaluated and updated the project's voltage-regulating controls and protective devices, ensuring they were tuned to avoid unnecessary tripping and effectively isolate disturbances.

Frequency and Voltage Protection Review: In accordance with NERC PRC-024-3, EPE conducted dynamic simulations of high and low voltage and frequency events to examine how the system responded. The analysis confirmed that the project met the required ride-through durations for solar and storage components under various operating conditions.

EPE acted as an extension of the project team, collaborating closely to review simulation results, adjust settings as needed, and deliver a final report documenting compliance with NERC standards.

Outcome

EPE's unique blend of technical knowledge and economic insight enabled the project to meet NERC PRC-019-2 and PRC-024-3 standards, ensuring it remains a reliable and resilient part of California's energy landscape. By fine-tuning protection settings, EPE's holistic approach ensured the system could handle voltage and frequency disturbances without unnecessary shutdowns, allowing it to operate smoothly even under challenging grid conditions.

With these crucial insights, the project is fully equipped to support California's renewable energy goals while delivering reliable and affordable power to residents. It not only complies with regulatory standards but also contributes to a more stable grid, ready to adapt to the growing demands of renewable energy integration.

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