

Announcement

Disturbance Report Emphasizes Continued Need for Industry Action, Provides Recommendations

October 2, 2023

ATLANTA – As inverter-based resources, including modern wind turbines, solar photovoltaic and battery energy storage systems, continue to drive grid transformation, they may also introduce potential risks to the system, as documented by NERC in multiple disturbance reports. As part of its [Inverter-Based Resource Strategy](#), NERC is dedicated to identifying and addressing these challenges, sharing risk mitigation techniques with industry and providing best practices and education.

The joint NERC–WECC [2022 California Battery Energy Storage System Disturbances](#) report assesses two events involving the unexpected, abnormal performance of bulk power system (BPS)-connected battery energy storage systems initiated by normally cleared faults in the Western Interconnection that occurred on March 9 and April 6 in 2022. These are the first significant events involving battery energy storage system facilities, highlighting the need to consider these systems in the same light as any other inverter-based resource.

“These events are the first faint signal that the systemic performance issues we have identified with other inverter-based technologies may very likely apply here as well,” said Ryan Quint, NERC’s director of Engineering and Security Integration. “Battery energy storage systems will play a critical role during the energy transition; therefore, it is imperative that we design, study, commission, and operate them in a manner that supports BPS reliability.”

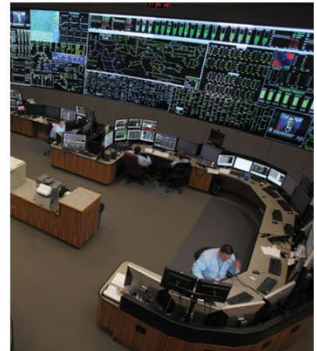
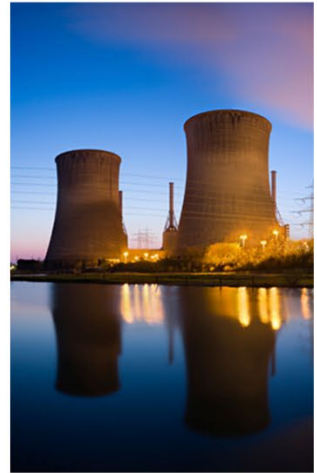
The report provides key findings and recommendations for industry action to address potential systemic reliability risks, including:

- Battery energy storage systems may have the same systemic performance problems as solar photovoltaic resources.
- Battery energy storage system ride-through performance is not adequately assessed during the interconnection process.
- Poor commissioning practices are a significant contributor to the unreliable performance of inverter-based resources.

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- NERC will conduct a model quality assessment of this event and subsequently issue an alert, as needed.
- Lack of adequate monitoring hinders performance and event analysis.

The report also includes two recommendations for Generator Owners:

- All Generator Owners should check with their inverter manufacturer to ensure that their inverters are not prone to tripping on the following causes, in addition to those previously reported, during normally cleared unbalanced grid faults:
 - Unexpected, unbalanced ac current
 - Unexpected dc bus overvoltage tripping
 - Unstable dc bus voltage
- All Generator Owners should ensure both inverter- and plant-level recording functions are configured to meet the requirements in the interconnection agreements. Additionally, Generator Owners should ensure fast logging is enabled and that meter data does not freeze on the last value when subjected to system transients during grid faults.

“The grid transformation we see in the Western Interconnection is an exciting yet challenging time. We know the value that battery energy storage systems contribute to the generation fleet, especially providing much-needed energy during times when solar resources are ramping down and demand is still high,” said James Hanson, manager, Operations Analysis at WECC. “We need to ensure these installations are planned, modeled, constructed and commissioned in ways that provide confidence these resources will perform as desired.” He added, “We appreciate the time, energy and resources from NERC, WECC and the California ISO dedicated to learning from and sharing this valuable information with industry.”

NERC and WECC encourage industry to take timely action to implement the recommendations in this disturbance report as well as those from past disturbance reports and related NERC reliability guidelines. The ERO Enterprise, made up of NERC and the six Regional Entities, will continue to analyze disturbances that involve widespread reductions of inverter-based resources to identify any reliability issues, support affected facilities in developing mitigating measures and share key findings and recommendations with industry for increased awareness and action.

NERC recognizes the need to harness all the unique capabilities of and provide a solution to the challenges presented by inverter-based resources to maintain grid stability, ensure a strong security posture from this growing sector, and reliably integrate these resources and technologies to achieve a resilient power system capable of meeting 21st century energy demands. NERC’s efforts in this area are a component of its [2023 work plan priorities](#), which strive to keep NERC at the forefront of the transformation by focusing on four key areas: Energy, Security, Agility and Sustainability. More information about NERC’s inverter-based resource efforts is available in the [Inverter-Based Resource Activities Quick Reference Guide](#).

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Electricity is a key component of the fabric of modern society and NERC, as the Electric Reliability Organization, serves to strengthen that fabric. The vision for the ERO Enterprise, which is comprised of NERC and the six Regional Entities, is a highly reliable and secure North American bulk power system. Our mission is to assure the effective and efficient reduction of risks to the reliability and security of the grid.