



Preventing Widespread Blackouts by Complying with NERC PRC-004-6

What is NERC PRC-004-6?

In the complex network of the North American power grid, reliability is paramount to prevent widespread blackouts and ensure uninterrupted electricity supply. The North American Electric Reliability Corporation's (NERC) PRC-004-6 addresses the critical need to mitigate risks associated with protection system misoperations within the Bulk Electric Systems (BES). This regulation applies to transmission owners, generator owners, and distribution providers, requiring them to promptly identify and correct causes of misoperations of protection systems for BES elements while retaining evidence for a minimum of 12 calendar months.



Identification of Misoperation (R1):

Transmission owners, generator owners, and distribution providers are required to develop documented processes for monitoring and assessing the performance of protection systems. Within 120 calendar days of a BES interrupting device operation, owners must identify whether their protection system component(s) caused a misoperation. This process involves comprehensive data collection, in-depth analysis, issue identification, and the development of corrective action plans (CAPs) to resolve any uncovered deficiencies.

Notification of Identified Misoperations (R2):

Effective communication among stakeholders is vital in addressing misoperations. Owners must promptly notify other entities sharing responsibility for misoperation identification. Within 120 days of a BES interrupting device operation, owners are obligated to provide notification to other owners and analyze protection system performance. This collaborative effort fosters timely information exchange and collective action in resolving potential vulnerabilities.

Checking Misoperation by Other Owners (R3):

Upon receiving notifications, stakeholders must diligently investigate whether their protection system components contributed to misoperations. This requires thorough analysis, testing, and documentation of findings. Within 60 calendar days, recipients must conclusively determine the root causes of misoperations and take appropriate corrective measures to address any identified deficiencies.

Corrective Action Plan (R5):

Timely and effective corrective actions are essential in addressing identified misoperations. Within 60 calendar days of identifying misoperation causes, owners must develop corrective action plans (CAPs) addressing the root causes. CAPs should include specific actions, timelines, verification methods, and personnel training to ensure the efficiency of corrective measures.

Corrective Action Plan Monitoring (R6):

The implementation and monitoring of CAPs are critical in ensuring sustained system reliability. Owners are tasked with diligently implementing and updating CAPs as necessary, ensuring that corrective actions are promptly executed and thoroughly documented. This process of monitoring shows the commitment to continuous improvement and proactive risk mitigation.

Compliance with NERC PRC-004-6 is imperative for maintaining grid reliability. By adhering to its requirements, utilities can proactively identify and address protection system vulnerabilities, minimizing the risk of misoperations and enhancing system resilience. Failure to comply may result in fines, emphasizing the significance of regulatory adherence in upholding grid integrity.

How can SynchroGrid help?

SynchroGrid's experienced engineers remain up to date with regulatory mandates, aiding clients in maintaining compliance and bolstering grid reliability while mitigating costly penalties. We provide solutions covering a spectrum of regulatory requirements, from PRC-002 to PRC-027, ensuring clients' seamless adherence to industry standards and fostering a resilient grid

infrastructure. Specifically for PRC-004-6, SynchroGrid can review protection systems to identify and correct misoperations, thereby preventing similar events from occurring in the future.

SynchroGrid has conducted numerous fault analysis studies and generated detailed reports summarizing the findings. Our expertise allows us to discern whether relays have functioned as designed or if any misoperations have occurred. Upon identifying potential issues, SynchroGrid has recommended and implemented updates to relay settings to minimize the likelihood of future unintended operations. Additionally, we have assisted in completing concise forms per event to ensure compliance with requirements.

Reference:

<https://www.nerc.com/pa/Stand/Reliability%20Standards/PRC-004-6.pdf>