

Enforcement Explained

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Protecting the grid in normal and abnormal conditions using the Generation Protection Standards

For RF's Enforcement department, our primary responsibility is reviewing and processing all identified instances of noncompliance. We invest time and resources in identifying patterns and trends in those noncompliances and while not all patterns have a discernable meaning or clearly attributable causes, the purpose of identifying trends is to pinpoint areas of potential increased risk.

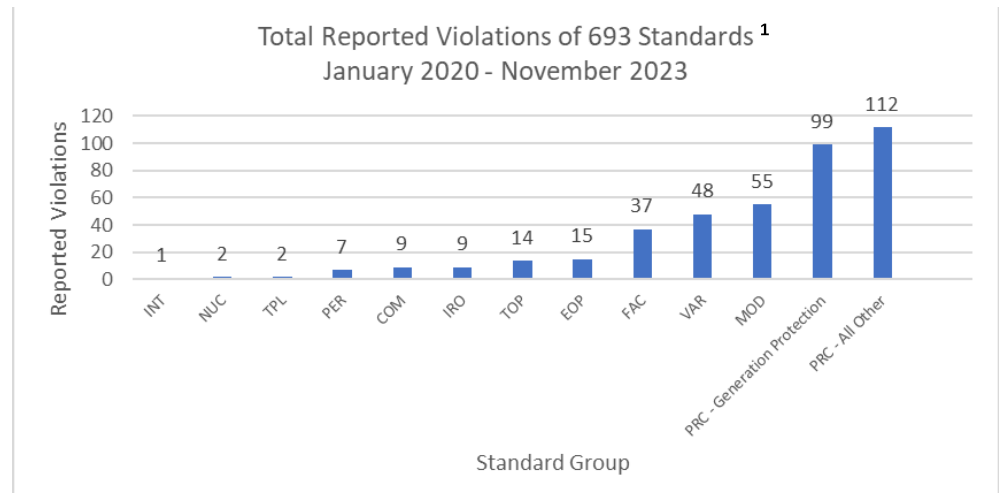
One trend that's stood out recently in this analysis involves the NERC Reliability Standards governing Generation Protection, specifically PRC-019, PRC-024, and PRC-025. From January 2020 through November 2023, the PRC standard group had the most reported instances of noncompliance among NERC Operations and Planning Standards by a large margin (156 more reported violations than the second highest, the MOD standard group). Within the PRC standard group, RF has noticed a marked increase in violations of PRC-019, PRC-024, and PRC-025 (the Generation Protection Standards), which make up approximately 47% of reported violations of the PRC Standard Group as a whole (see chart to the right).

These three PRC standards are interrelated and overlap in their purposes. PRC-019 focuses on coordinating generator unit equipment capabilities, voltage controls, and Protection Systems. PRC-024 and PRC-025 protect against unnecessary tripping during BES disturbances. Specifically, PRC-024 addresses frequency and voltage protection settings for generating resources, and PRC-025 governs the loadability of generator relays. In short, these Generation Protection Standards are designed to ensure relays will not unnecessarily trip under normal system conditions and to prevent the unnecessary and unexpected loss of more generation than necessary during extreme conditions.

These standards demonstrate their value and purpose at the most important time: when the grid is in a vulnerable state. They are standards that help industry to prevent and control system events during severe weather events, like Winter Storm Elliott, as well as amidst the ongoing changing generation mix, including the retirement and replacement of generators. When entities ensure that they are meeting the requirements of, and prioritizing, the Generation Protection Standards, they are not only complying with regulatory standards but protecting their equipment from potential damage and their customers from power losses when they may be most vulnerable.

Underlying noncompliance data and volume

From January 2020 through November 2023, RF received 99 violations (an average of approximately 25 per year) of the Generation Protection Standards. This represents an increase from already high numbers in 2018 and 2019 when RF received 43 violations (an average of approximately 21 per year) of the Generation Protection Standards. While an increase in violations does not equate to an inherent elevation of risk, it does indicate that resources may need to be allocated to ensure these Operations and Planning Standards are not becoming a footnote in compliance programs.



Common underlying root causes leading to violations and how to proactively work toward compliance

In reviewing the underlying cases, RF has recognized three common root causes: (1) lack of timely planning; (2) lack of sufficient knowledge and understanding of requirements; and (3) lack of adequate contractor oversight and internal control measures.

First, many of the Generation Protection Standards have time-based triggers which require entities to identify upcoming needs for modeling, testing, and other activities well in advance of the compliance deadline. RF has noted a common trend in root cause is an entity's failure to adequately plan ahead and provide themselves with sufficient buffer to accommodate

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unexpected setbacks (e.g., cancellation of planned outages, weather events preventing testing). To ensure that deadlines are not passing without the necessary requirements being performed, entities need to start looking at how they are going to comply with, for example, a five-year requirement in the years, not days or months, before the deadline.

Second, some of the Generation Protection Standards included phased-in implementation over a multi-year period.² NERC and FERC provide entities with runways to develop and institute compliance programs, but nevertheless, we are seeing entities that misunderstand specific requirements and expectations, and entities that misunderstand, or take incorrect approaches to, phased-in implementation.

For example, in an instance of PRC-019 noncompliance, an entity failed to understand that the coordination described in Requirement 1 needed to be verified following an equipment upgrade that could affect coordination. In other instances of noncompliance with these standards, entities failed to understand that certain types of relays were subject to the requirements. When a standard becomes effective, adequate training for relevant staff is key to successful and timely compliance.

The staff responsible for executing the requirements and sub-requirements of any given standard should be trained on their specific responsibilities within the standard's compliance landscape. Entities need to be proactive about identifying their applicable assets and determining where each asset fits into implementation milestones to avoid missing milestone deadlines.

Third, RF notes that numerous violations of the Generation Protection Standards arose from a lack of adequate internal controls to verify either the entity's own work or the work of third-party contractors. When entities contract with third parties to perform studies, installations, and other activities, entities should have procedures in place to verify that work in real or near-to-real time. RF recognizes that the Generation Protection Standards apply to entities of many sizes, which can make certain levels of verification resource-prohibitive. However, simple mechanisms such as checklists confirming certain key metrics prior to powering on a generator after service or a study may aid in identifying (and thereafter correcting) an issue.

Concluding Thoughts

At RF, the volume of violations of the Generation Protection Standards is of concern because these standards represent the guardrails that support the grid when conditions are normal and protect the grid when conditions become abnormal. As the generation mix changes and severe weather events become more common, the frequency of abnormal grid conditions may increase, and it's critical that steps are taken ahead of time to ensure that reliability is sustainable during abnormal conditions.

¹There were no violations of the BAL Standard Group reported to RF between January 2020 and November 2023.

²The effective dates for the Analyzed PRC Standards are as follows. Please note that many of these standards had phased implementation plans meaning that each standard did not apply to all entities or all entity assets on the effective date.

PRC-019-2	July 1, 2016	Phased Implementation per PRC-019-1 Implementation Plan
PRC-024-2/3	Version 2: May 29, 2015; Version 3: Oct. 1, 2022	No phased implementation for Version 3
PRC-025-2	July 1, 2018	Phased implementation

Contact Entity Engagement

We encourage registered entities to [reach out to our Entity Engagement team](#) if they have questions regarding their approach to the issues discussed in this article.