

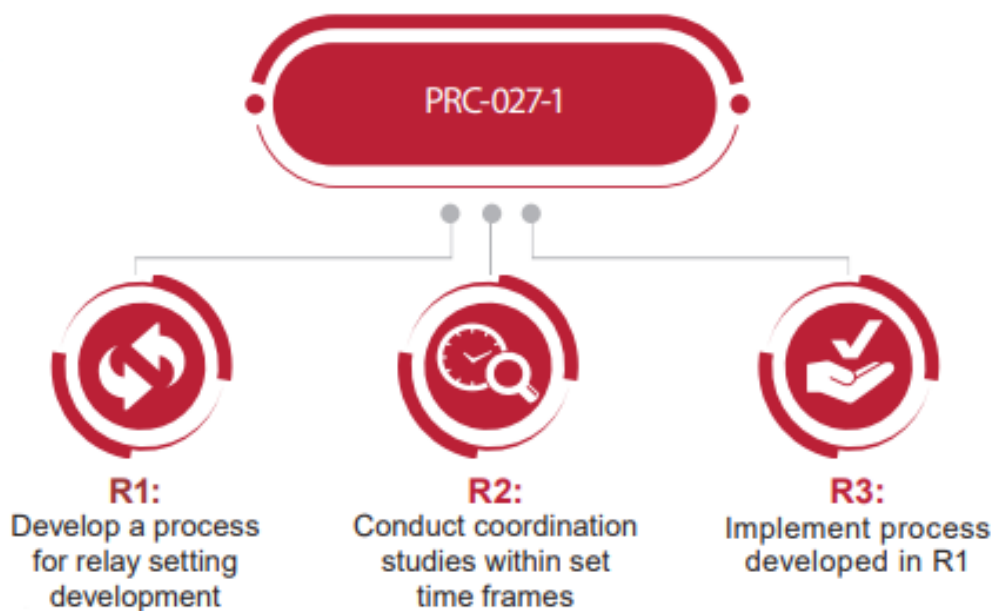


Keeping Up with NERC PRC-027-1 Requirements

Is your company keeping up with the NERC PRC-027-1 requirements?

North American Electric Reliability Corporation's (NERC) PRC-027-1 regulation, effective since April 1, 2021, mandates power and utility companies to align their relay settings processes and procedures by **April 2027** to prevent penalties. Taking immediate action is imperative to ensure compliance and avoid potential financial consequences. Under NERC PRC-027-1, utilities are obligated to fulfill three specific requirements:

- 1) Establish a process for developing new and revised protection system settings.
- 2) Perform a protection system (relay) coordination study periodically as determined by the options provided in the standard.
- 3) Develop or revise protection system settings based on the process identified in the first requirement.



How can SynchroGrid help?

SynchroGrid has developed a traditional consulting solution and an automation solution to aid utilities in complying with this latest NERC regulation.

SynchroGrid's Consulting Solution to PRC-027-1

SynchroGrid has helped numerous power and utility companies develop an established workflow from relay setting development to wide area coordination. SynchroGrid's methodical workflow utilizes well-defined protection philosophies, sanitizes and verifies the short-circuit model, and includes a thorough review process using automation scripts to crosscheck results and ensure reliability. The SynchroGrid team is also very familiar with the compliance requirements and creates thorough reports to ensure all requirements are met.

SynchroGrid's Automation Solution to PRC-027-1

SynchroGrid's software tool, SARA (Setting Automation Relay Assistant), provides an automated solution for all three PRC-027-1 requirements.

To comply with R1, this state-of-the-art tool empowers utilities to establish a streamlined process for relay setting development by constructing a settings philosophy template within the software that is customized to the utility. This template standardizes the way settings are developed and generates a well-documented relay settings report.



Once the philosophy template has been created, the utility can use SARA's Wide Area Coordination module to select criteria for the wide area coordination study required by R2 of the standard. After choosing the criteria, the study can be run by applying the philosophy template in SARA. When the coordination study is run, SARA bi-directionally communicates with the short circuit program and creates a wide-area analysis of the specified region within minutes. SARA can also generate a report that can be used as documentation for compliance purposes.

Whether reviewing or developing relay settings processes, performing wide area coordination studies, or creating compliance reports, SynchroGrid is experienced in delivering the expertise, tools, and processes that increase efficiency and avoid compliance issues.

Case Studies

The SynchroGrid team recently supported the following projects:

SynchroGrid performed wide area coordination studies for two major clients as part of NERC PRC-027-1 R2. This project included verifying proper relay operation and coordination of zone and overcurrent elements. Coordination criteria included Zone 1, Zone 2, Zone 3, and Zone 4 reaches, out of sequence, out of order operations, and CTI mis-coordination. All verifications were made using CAPE's CUPL macro language.

SynchroGrid performed a wide area coordination for another major client as part of NERC PRC-027-1 R2. This project included verifying proper relay operation and coordination of zone and overcurrent elements. Coordination criteria includes Zone 1, Zone 2, Zone 3, and Zone 4 reaches, out of sequence, out of order operations, and CTI mis-coordination. All verifications will be made using ASPEN's PowerScript language.

Reference:

<https://www.nerc.com/pa/Stand/Reliability%20Standards/PRC-027-1.pdf>