



NERC PRC-027-1 Compliance

Comprehensive Compliance Solution for PRC-027-1

NERC's PRC-027-1 standard goes into effect on October 1, 2020. It requires transmission owners, generation owners, and distribution providers to perform periodic review of the coordination of their protection systems installed on the Bulk Electric System (BES) to ensure that the protection systems operate in the intended sequence during faults. The standard has three main requirements:

R1. Establish a process for developing new and revised protection system settings for BES elements such that the protection systems operate in the intended sequence during faults.

R2. Perform protection system coordination studies periodically, as per options described in the standard.

R3. Develop new protection system settings by following the process developed in requirement R1.

PRC-027-1 compliance covers many different aspects, some requiring significant effort for preparation and execution. Therefore, it is important to plan ahead and adopt an approach that is comprehensive and provides long-term efficiency.

Service Offerings

Quanta Technology provides automation-based solutions that can assist utilities with all aspects of PRC-027-1 compliance, such as establishing processes, preparing the protection model for coordination studies, performing studies, data management, and compliance reporting. By combining our expertise in protection systems analysis with automation tools that we have developed in-house over several years, Quanta Technology can leverage advanced protection modeling and simulation capabilities of industry-

standard protection simulation software (e.g., CAPE, ASPEN, etc.), to offer a comprehensive and efficient solution to meet PRC-027-1 requirements.

Quanta Technology offers services to perform and manage the labor-intensive and challenging tasks of model preparation and compliance studies and also offers its customers the flexibility to license the automation tools enabling them to perform, as well as manage, these tasks in-house more efficiently. The existing automation-based solutions and applications can be readily adapted to meet utility needs and preferences.

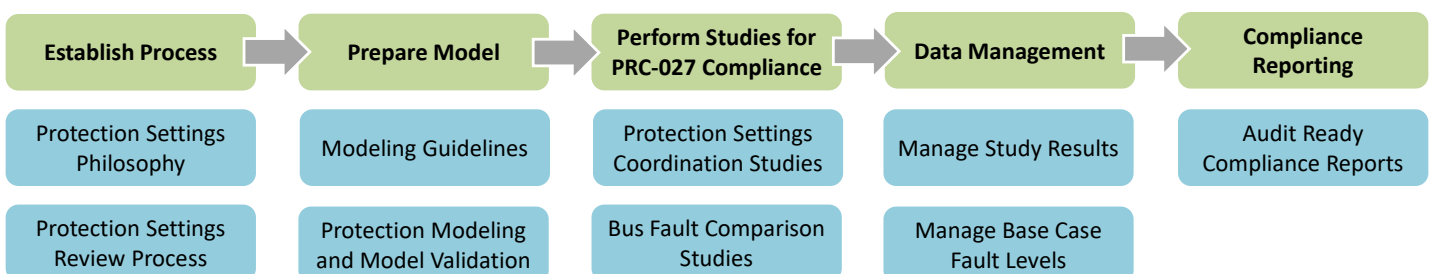
Why Quanta Technology

Quanta Technology has protection experts who are leaders in the industry and can consult on establishing processes for the implementation of PRC-027-1 including developing protection settings and coordination review philosophy.

Automated Protection Modeling and Validation Using QT-PDM™

The QT-Protection Data Manager (QT-PDM™) is a data processing and management application that can directly interface with relay settings repositories (e.g., Powerbase, ASPEN RDB, IPS, or native folder structures). It has the capability to parse relay settings files in native vendor-provided formats to extract protection settings data and can provide a fully-automated solution for preparation, validation, and future maintenance of the protection model.

Solutions for All Aspects of PRC-027-1 Compliance





Key Issues of PRC-027-1 Implementation

- PRC-027 process definition
- Input Settings into ASPEN/CAPE
- Specification of fault scenarios for calculation
- Preliminary study to define a base case
- Periodic review and documentation of bulk energy storage (BES) coordination

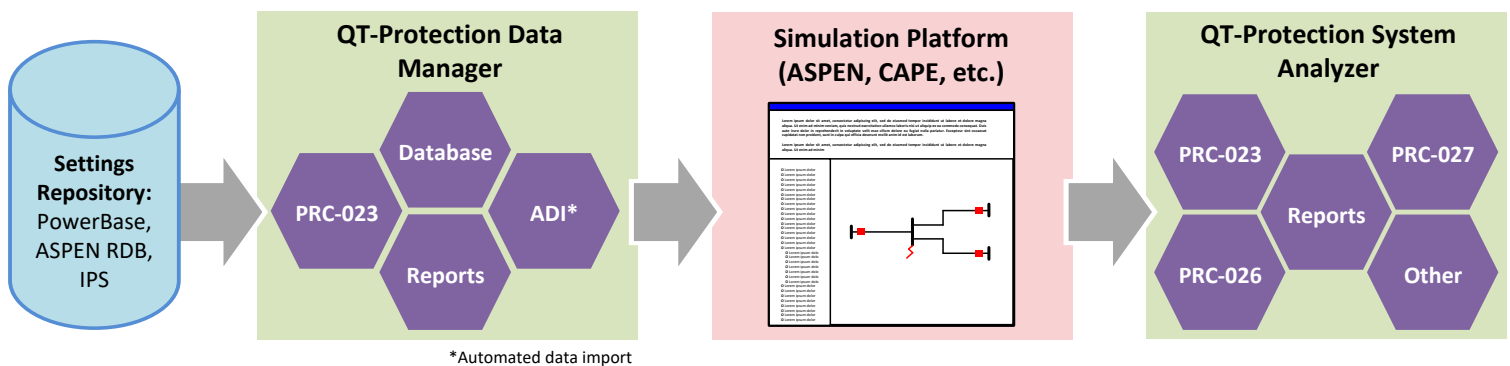
Automated PRC-027-1 Compliance Studies Using QT-PSA™

The QT-Protection System Analyzer (QT-PSA™) is a post-processing and reporting application utilized to analyze study results generated by industry-standard power systems simulation platforms (CAPE, ASPEN, etc.). Whether customers choose to follow option 1, 2, or 3 of PRC-027-1 Requirement R2, the QT-PSA™ can help make the compliance process more efficient. The fundamental protection studies that are required for compliance with PRC-027-1 Requirement R2 are:

- **Protection Coordination Studies:** Quanta Technology has expertise in developing/customizing scripts for performing protection studies using CAPE, ASPEN, and CYME, as per the specific coordination review criteria of a utility. Furthermore, QT-PSA™ can help make the review process more efficient by analyzing and condensing the raw data generated by the studies, thus allowing engineers to focus on the main issues.
- **Bus Fault Comparison Studies:** QT-PSA™ can provide an automated solution for bus fault comparison studies that supports customer preference for the method of storing the base-case fault levels and the short circuit software used for fault studies. In addition, QT-PSA™ can automate the identification of BES elements requiring coordination studies based on fault comparison study results and the coordination review criteria.

Data Management and Compliance Reporting Using QT-PSA™

The QT-PSA™ tool also has the option of integrating a tracking database that can provide an intelligent solution for tracking BES elements and base-case fault levels, maintaining records of fault comparison and coordination studies, and generating audit-ready compliance summary reports.



About Quanta Technology

Quanta Technology is an independent technology, consulting, and testing company providing business and technical expertise, along with advanced methodologies and processes, to utilities and others in the power and energy industries. Our mission is to provide unparalleled value to our clients in every engagement across the value chain by using advanced software and hardware, laboratories, and custom tools for a holistic approach to practical service and the most insightful thought leadership in the industry.

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Smart Solutions Practical Results

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