QUANTA TECHNOLOGY

COMPREHENSIVE COMPLIANCE SOLUTIONS

Protection, Control & Automation

NERC PRC-026 Reliability Standard

Automated Compliance Evaluation of PRC-026

The NERC PRC-026 Reliability Standard is a mandatory set of requirements intended to ensure that load-responsive protective relays associated with Bulk Electric Power System (BES) elements do not trip in response to stable power swings during non-fault conditions. The process of PRC-026 compliance requires comprehensive review of distance and overcurrent-based protection device settings and evaluation against a set of criteria calculated from system conditions and configuration.

Similar to other NERC Protection and Control Reliability Standards, evaluating compliance with PRC-026 requirements can pose significant challenges to utilities, particularly if the entity is responsible for a large and complex transmission network. In addition to the large-scale data management and technical expertise involved, applicable entities are also required to maintain documentation showing proof of compliance.

To efficiently meet and maintain compliance with the PRC-026 standard, a methodology that is suitable and effective for tracking and evaluation across large-scale networks is required.

Service Offerings

Quanta Technology provides solutions to assist utilities and applicable entities with the challenges of NERC PRC-026 compliance for transmission networks both large and small. These offerings cover a broad range of aspects, from process design to compliance study implementation.

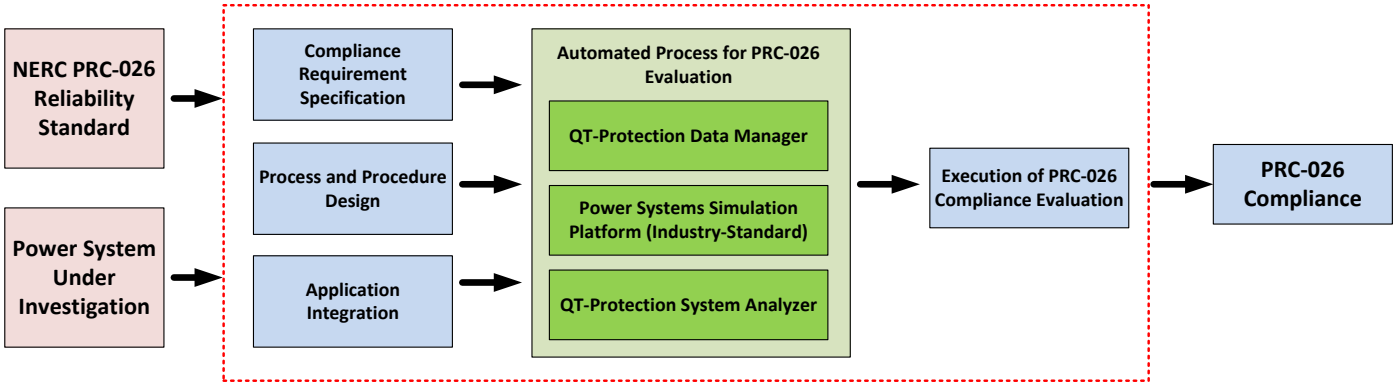
To enable the studies to be conducted in a systematic, reliable, and efficient manner across potentially hundreds or even thousands of protective elements, Quanta Technology's evaluation methodology leverages the benefits of software-based automation, particularly with regard to large-scale data management and processing. An integrated approach involving the utilization of both proprietary software applications and industry-standard power systems simulation packages is offered as an effective solution to meet the needs of PRC-026 compliance.

In addition to the technical execution of the studies, Quanta Technology can also assist utilities in the areas of compliance requirement specification, process and procedure design, and integration of offered applications with existing compliance programs.

Why Quanta Technology

Quanta Technology offers an integrated process for the large-scale evaluation of PRC-026 requirements, taking advantage of software-based automation to enable the studies to be completed efficiently and reliably. The process stages of preparation, evaluation, and results analysis are carried out through the use of custom-developed applications and industry-standard power systems simulation platforms (CAPE, ASPEN, etc.).

Quanta Technology NERC PRC-026 Compliance Offerings



The Role of Power Systems Simulation Software:

- **System Impedances**

  The criteria for PRC-026 evaluation is calculated from system impedance parameters, such as equivalent impedance of the system both behind the relay (sending-end) and beyond the remote terminal of the line under study (receiving-end). The power systems simulation platform is utilized to obtain these evaluation parameters from the primary system model.

- **Protection Models**

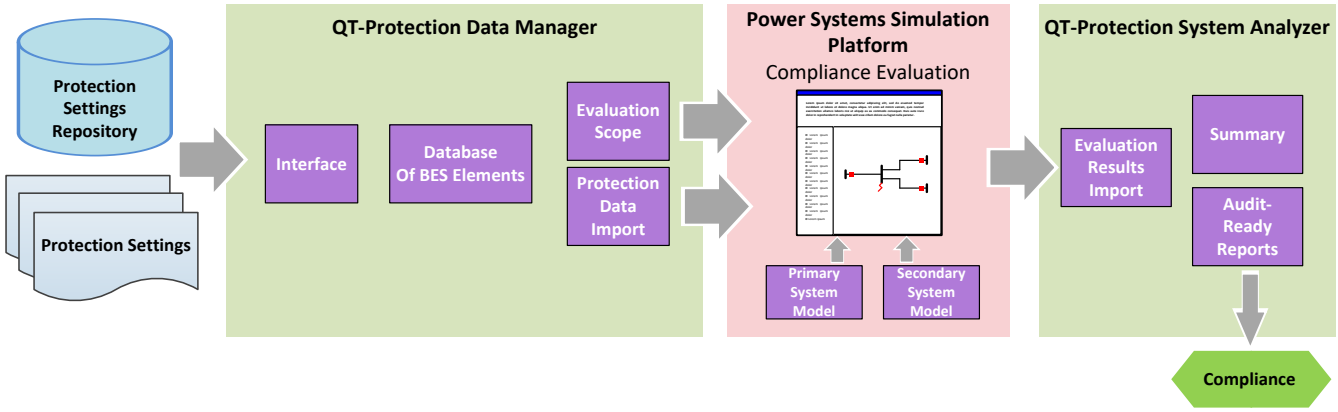
  The protective elements under investigation are impedance and overcurrent-based relay trip functions. The settings for these functions are obtained from the secondary system model within the power systems simulation platform.

The **QT-Protection Data Manager (QT-PDM™)** is a data processing and management application used to obtain and prepare the data required in the execution of compliance studies. For the PRC-026 evaluation process, the QT-PDM™ is responsible for preparation stages, particularly the generation of a list of lines and system elements to be evaluated by the power systems simulation platform (CAPE, ASPEN, etc.). This application also provides automation-assisted protection modeling in the power systems simulation platform from vendor-native relay-settings files.

The evaluation of PRC-026 requirements is conducted by a macro-enabled power systems simulation platform (CAPE, ASPEN, etc.) that contains both the system (primary) model and the protection (secondary) models under investigation. The use of macros and computer-based calculation enables the evaluation study to be conducted for multiple protection elements in an efficient and standardized manner. The evaluation results for each line or system element is recorded to an external file, which can be further processed. Quanta Technology's tools and processes are compatible with the major protection-focused simulation packages utilized by industry today.

The **QT-Protection System Analyzer (QT-PSA™)** is a post-processing and reporting application utilized to organize and analyze the evaluation results generated by the power systems simulation software. This tool has the capability to present the evaluation data and compliance verdict in user-friendly summaries, enabling engineers to consider compliance on a large-scale system-wide basis. Audit-ready reports can be generated to meet regulatory or internal documentation requirements.

This automation-based methodology enables Quanta Technology to offer the execution of wide-area evaluation studies in a systematic and reliable manner to determine PRC-026 compliance across any size of transmission network.



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