



NERC PRC-023 Reliability Standard

Automated Compliance Evaluation of PRC-023

The NERC PRC-023 Reliability Standard is a mandatory set of requirements that defines one aspect of planning and operating the North American Bulk Electric System (BES). With the intended purpose of ensuring that protective relay settings do not limit transmission loadability, compliance with the standard requires an extensive review of protective device settings and evaluation against a set of criteria calculated from thermal emergency ratings.

The process of PRC-023 compliance evaluation can pose major challenges to utilities, particularly when considering an entire transmission network that may contain hundreds of protective relays under investigation. Due to the potential size and complexity of existing transmission systems, a PRC-023 compliance study may require extensive data management and significant technical effort to complete. In addition to the technical aspects, utilities and applicable entities are also mandated to maintain auditable documentation of their investigation process and evidence of compliance.

An effective compliance program to meet PRC-023 requirements needs to consider an approach that offers a uniform and repeatable evaluation methodology that may be utilized across an entire transmission network.

Service Offerings

Quanta Technology provides automation-based solutions to the challenges of compliance with the NERC PRC-023 Reliability Standard, covering a full range of

offerings to assist utilities in meeting PRC-023 requirements from start to finish, and across any sized transmission network.

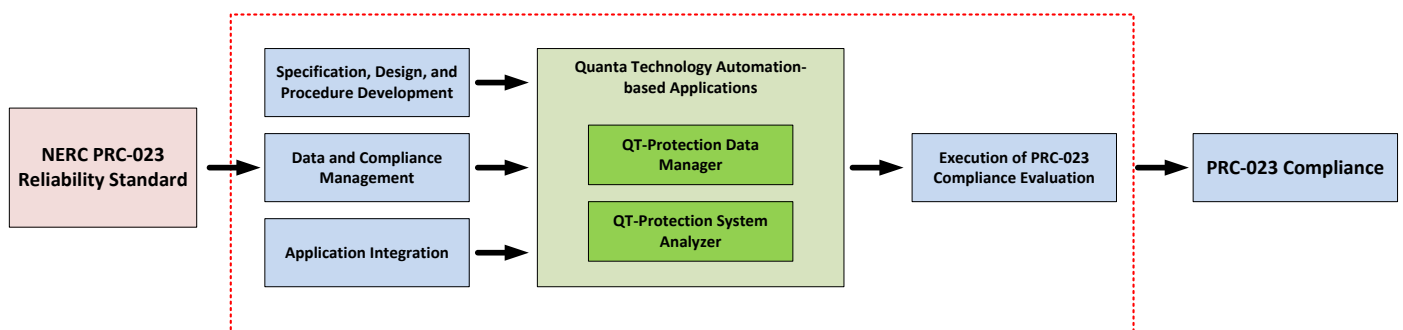
The central concept behind these offerings is the leveraging of software-based automation to support integrated processes and enable the systematic evaluation and documentation of the compliance evaluation studies. These processes have the capability to function as a complete integrated solution, or they may be utilized in part to support existing compliance programs. These software tools feature capabilities ranging from integration with relay settings repositories to workflow management and compliance evaluation.

In addition to the technical processes and evaluation tools for PRC-023 compliance, Quanta Technology also offers services to assist utilities in the specification, design, and procedure development of their compliance programs to meet NERC standards requirements. Additionally, the existing automation-based solutions and applications can be readily adapted to meet utility needs and preferences.

Why Quanta Technology

Quanta Technology has developed a set of tools featuring a comprehensive range of capabilities to support NERC PRC-023 compliance evaluations for even large-scale transmission networks. These tools may be employed as a complete integrated process, or used in part to support existing compliance programs.

Quanta Technology NERC PRC-023 Compliance Offerings



**Featured automated components:**➤ **Unified Relay Settings Mapping Engine**

Library module matching tap names of common relay types to their protective function, enabling the identification of relay elements and settings directly from vendor-native settings files

➤ **NERC-PRC Computation Engine**

Evaluation module that calculates evaluation criteria from PRC-023 requirements and inputted thermal data, enabling the compliance study to be conducted without need for external simulation software

➤ **Automated Data Import (ADI)**

Data import module that supports automated modeling of protective relays in industry-standard simulation software

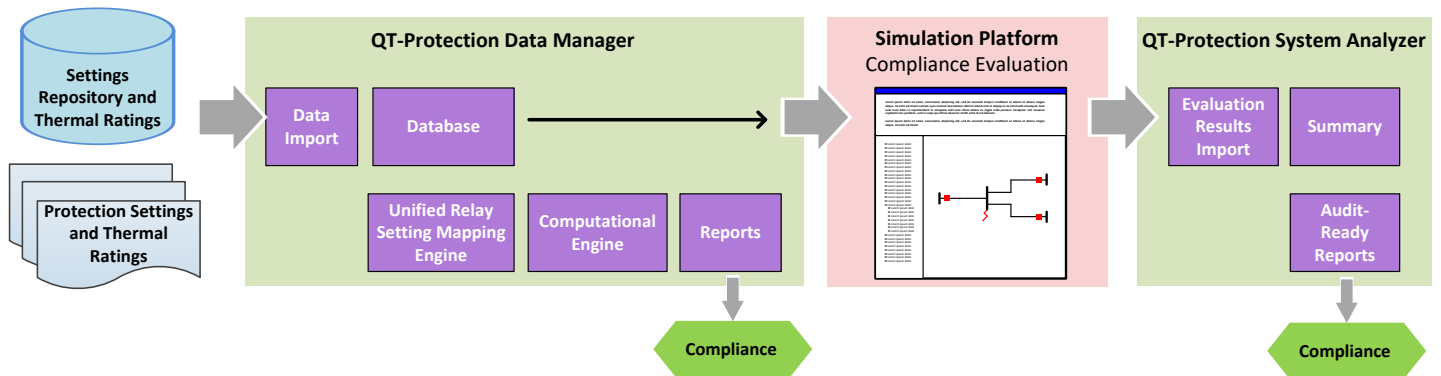
When used as part of a complete process, the tools cover all elements of the evaluation study from start to finish, including obtaining and parsing relay settings data, evaluation of compliance through internal computational engines or in conjunction with industry-standard simulation software (CAPE, ASPEN, etc.), organization and presentation of results, and generation of detailed summaries and reports for documentation and audit purposes.

The **QT-Protection Data Manager (QT-PDM™)** is a data processing and management application utilized to obtain and prepare the data required by the evaluation studies. The QT-PDM™ provides the following capabilities:

- Interfacing with relay settings repositories to automatically obtain relay files required for the scope of the study
- Parsing of relay settings files in native vendor-provided formats to determine settings for the pertinent functions under investigation
- Facilitation of the evaluation of relay settings against the PRC-023 requirements through the application's built-in computational engine or in conjunction with industry-standard software packages
- If operating as a standalone using the built-in computation engine – organization of data into user-friendly summaries to show system-wide compliance and enable quick identification of potential issues
- Generation of audit-ready reports to meet regulator or internal documentation requirements

The **QT-Protection System Analyzer (QT-PSA™)** is a post-processing and reporting application utilized to organize the evaluation results generated by industry-standard power systems simulation platforms (CAPE, ASPEN, etc.). Similar to the QT-PDM™, this tool also has the capability to present the evaluation data in user-friendly summaries and generate audit-ready reports.

This automation-based approach enables Quanta Technology to offer the execution of wide-area evaluation studies in a systematic and reliable manner to determine PRC-023 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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