Experienced Relay Settings Support

Protection Settings

Modern protection and control systems have become remarkably complex. Calculating transmission and distribution relay settings, complying with NERC reliability standards, designing and reviewing protection schemes, and updating and validating settings and databases are just a few of the many challenges requiring increasingly sophisticated modeling and study tools in order to simulate and analyze the dynamic behavior of today's power networks.

Testing with an Real-Time Digital Simulator (RTDS®) system has shown significant value in testing power system protection and control applications. RTDS is primarily developed and utilized for hardware-in-the-loop (HIL) testing of protective relays, digital controllers, and process control devices for performance evaluation and pre-commissioning testing under close-to-real-world conditions. Also, HIL testing is commonly used for prototype development and/or finalizing a new application design involving several digital control, protection, and measurement devices.

NERC CIP

North American Electric Reliability Corporation

PRC-023, PRC-025, PRC-026, PRC-027, and CIP v5

Service Offerings:

- Protection settings support
- Compliance studies
- Wide-area protection coordination studies
- Support for CAPE, ASPEN, CYME, ETAP, Synergi, and others, including primary and protection model setup and V] validation
- Advanced protection topics.

T&D Protections Settings Support

Quanta Technology's team of experts and protection engineers have extensive experience working with T&D relay settings calculations, providing protection settings support to utility (and non-utility) customers by performing fault studies using industry-standard software (ASPEN, CAPE, CYME, etc.) to develop settings based on our clients' protection philosophies.

Quanta Technology also performs third-party peer review on settings work performed by other entities. This includes applications such as Distributed Energy Resources (DER), series compensated lines, and other technically challenging topics.

Compliance Studies

Quanta Technology has extensive experience in RTDS testing based on our work with utilities and manufacturers from all over the world. We have utilized a combination of testing automation and process enhancements to reduce the time it takes to conduct RTDS testing, while simultaneously improving the quality of the results. Our goal has been to optimize the process to ensure all necessary tests are conducted as efficiently as possible.

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Wide-Area Protection Coordination Studies

Over time, relay settings may be impacted by system changes. Quanta Technology performs studies to review relay coordination across the transmission grid with testing for sensitivity analysis, evaluation of protection performance under numerous fault cases and contingencies, and generation of actionable reports for utility engineers to rank issues found based on pre-defined risk levels.

This study not only provides a detailed coordination review with numerous fault and contingency issues, but ensures that the system and relay data is configured in the short circuit and settings management databases. Our experience has helped utilities to review and address latent issues and provides a solid base case for future PRC-027 studies.

CAPE, ASPEN, CYME, and Other Support

Today's complex and integrated protection and control systems require more sophisticated modeling and study tools to simulate and analyze the dynamic behavior of the power network. Our protection experts provide support to utilities and others in updating and validating their short-circuit databases, as well generating automated reports or summaries from Powerbase, CAPE, ASPEN or other tools for settings summaries and NERC compliance records.

Advanced Protection Topics

In addition, Quanta Technology offers comprehensive studies on advanced topics.

Areas include:

- Development or review of protection philosophy
- Development or review of templates for protection settings
- Process to map PSS/E primary model to short-circuit programs
- Provide independent assessment of the various compliance or short-circuit tools on the market, based on the utility's needs and provide assistance in tool evaluations and selection
- Development of processes for compliance studies such as PRC-027 or processes to adapt IEC 61850
- Independent assessment of relay performance
- Wide-area disturbances and event report review
- Working with utilities on the development, evaluation, and testing of special protection schemes and wide-area monitoring protection and control using phasor measurement units (PMUs).

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