35kV Relay Protection Device Commissioning Method



Overview

Commissioning tests are done to show that a particular protection configuration has been correctly used prior to setting to work.

Key Takeaways

Commissioning a 35kV relay protection device involves systematic pre-checks, functional testing, calibration, and verification under simulated fault conditions to ensure reliable operation.

Pre-

Commissioning Preparations

Before commissioning, ensure all documentation, wiring diagrams, and relay settings are available. Verify that the relay, current transformers (CTs), voltage transformers (VTs), and associated circuit breakers are correctly installed and undamaged. Conduct insulation resistance tests, polarity checks, and loop resistance tests on pilot wires and control circuits to confirm proper connections and integrity of the system.

Type and Factory Tests

Type tests are performed at the manufacturer to confirm that the relay meets IEC 60255 and IEEE C37.90 standards, including environmental and electrical stress tests. These tests ensure the relay functions correctly under abnormal conditions and is free from manufacturing defects.

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Commissioning Tests

Visual and Mechanical Checks: Inspect the relay, CTs, VTs, and breakers for physical damage, correct mounting, and proper labeling. Secondary Injection Testing: Apply controlled currents and voltages to the relay inputs to verify tripping, inter-tripping, and alarm functions. Confirm that the relay operates according to the configured settings.

Calibration: Adjust the relay settings for phase-to-phase and ground fault protection, ensuring sensitivity matches the 35kV bus and transformer configuration. For series-connected reactors or transformers, impedance protection settings must be tuned to detect inter-phase short circuits accurately. Functional Testing: Simulate fault conditions using primary or secondary injection to verify the relay triggers the correct breaker operation within the preset time delays.

Check coordination with backup protection devices. Integration Verification: Confirm that the relay interacts correctly with circuit breakers, shunt reactors, capacitor banks, and busbar protection schemes. Ensure all signals, alarms, and interlocks function as intended.

Post-

Commissioning Checks

Record all test results and compare them with design specifications. Verify that relay settings, CT ratios, and VT ratios are correctly documented. Conduct a system stability check under through-current conditions to ensure the relay does not operate incorrectly during normal load.

Schedule periodic maintenance and functional tests according to NERC PRC-005 or local standards to maintain reliability.

Key Considerations

Always isolate the system safely before testing to prevent hazards.

Use LV or H

V test sources as appropriate, including step-up transformers for primary injection if needed. Ensure coordination with other protection devices to avoid nuisance tripping or failure to clear faults. By following these steps, a 35kV relay protection device can be commissioned safely and reliably, ensuring proper operation under fault conditions and integration with the substation's protection scheme.

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Article Content

Installing and Maintaining Protective Relay Systems

Facilities need to perform installation tests, implement preventive maintenance programs, and perform comprehensive commissioning tests to verify the integrity of both existing protective relay systems

Protection Relay Testing and Commissioning

Commissioning tests are done to show that a particular protection configuration has been correctly used prior to setting to work.

Testing & Commissioning of Protective Relays Training ...

Overexcitation Protection Overfluxing, also referred to as Volt per Hertz protection. More than 30 minutes on the config, logic, and testing of

Testing & Commissioning Protective Schemes

The purpose of the commissioning tests is to ensure that connections are correct, that the performance of current transformers and relays agrees with the expected results and that no

Protective Relay Commissioning Guide

This document discusses commissioning and maintenance of protective relays. It recommends secondary injection testing with relays isolated as the preferred test method.

Distribution Automation Handbook

When the protection is implemented using a current relay, the current value at which the relay should operate must be determined first. By means of the stabilizing voltage and the current setting, the

Installation and commissioning

The health of the protection system should be ensured at regular intervals by applying suitable testing methods. Checking other design aspects such as the application configuration, including relay

Substation Commissioning Procedures

Assess the operation of circuit breakers, protective relays, isolators and control panels. Then, check for proper sequencing and coordination of protective devices.

Commissioning

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Commissioning services go far beyond protection relay testing. They include the analysis and verification of several key aspects, such as: Performance, communication, and interoperability testing according

Commission Testing Methods for Protection Systems

Best practices for commissioning of each NERC PRC-005 protection system component and examples of real world issues found during commissioning are discussed as well as the importance of records

Power System Protective Relays: Principles & Practices

Abstract: Protective relays and devices have been developed over 100 years ago to provide “last line” of defense for the electrical systems. They are intended to quickly identify a fault and isolate it so the

Protection Relay Testing and Commissioning

PROTECTION RELAY TESTING AND COMMISSIONING The testing and verification of protection devices and arrangements introduces a number of issues. This happens because the main function

Operation, maintenance, and field test procedures for

The protection circuits include all low-voltage devices and wiring connected to: instrument transformer secondaries, telecommunication systems,

IEEE PSRC, WG I-25 May 10, 2017 Commissioning Testing of Protection

Communicating testing requirements - The commissioning agent is responsible for defining appropriate visual checks, measurements and tests required verifying the design and construction of a substation

Electrical System Commissioning Manual

This may involve information and data relating to protective devices and relays. Such data are usually found in a short-circuit coordination study and usually encompass all the short-circuit values

Protection Relay Testing For Commissioning SWP: 1. Purpose and

The document provides guidance for testing protection relays during commissioning of substations. It outlines the purpose and scope, required staffing and tools, definitions, test plans structure and

Testing & Commissioning Protective Schemes

Generally protective equipment testing may be divided into three stages: Factory tests. Commissioning tests. Periodic maintenance tests. Factory and commissioning tests confirm the

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CHAPTER-3

The design of a protective system should include backup protection to allow for failures and for periodic maintenance of the interrupting devices, sensing devices, and protective relays.

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