

State Grid Relay Protection Standardization Manual



AI Overview

State Grid relay protection standards are primarily based on IEC 60255 functional standards, IEC coordination principles, and IEEE guidelines, ensuring reliable, selective, and interoperable protection of power systems.

Overview of Relay Protection Standards

Relay protection standards define the functional requirements, testing procedures, and coordination practices for protective relays in electrical power systems. These standards ensure that relays operate accurately, reliably, and selectively to isolate faults while maintaining system stability and minimizing service interruptions.

Key International Standards

IEC 60255 Series

The IEC 60255-1xx series specifies functional requirements for measuring relays and protection equipment used in transmission and distribution systems. It covers analog and digital inputs, binary outputs, and protection functions such as overcurrent, earth fault, frequency, and ROCOF (Rate of Change of Frequency) protection. The standards define minimum performance criteria, testing methodologies, and evaluation formats to ensure interoperability and reliability across devices from different manufacturers.

IEC Coordination Standards

IEC 60255 and IEC 60947 provide guidelines for relay coordination, including time-current curves, selectivity criteria, and grading margins. Proper coordination ensures selective tripping, where only the faulted section is disconnected, preventing unnecessary outages and maintaining system stability. In radial or meshed networks, downstream relays often use very inverse curves, while upstream relays use standard inverse settings to achieve smooth time discrimination.

IEEE Standards

IEEE standards such as C37.91, C37.95, C37.96, C37.101, and C37.102 provide guidance for protective relay applications to transformers, generators, motors, and industrial systems. These standards address relay selectio...

Article Content

Development Status and Prospects of Relay Protection Technology in ...

This paper explores the development of relay protection technology in smart grids, analyzing its applications in intelligent algorithms, digital devices, and automated coordination.

Protection Engineers Handbook: Relays, Testing, & Standards

A comprehensive handbook for protection engineers covering relays, testing, standards, and protection schemes for generators, transformers, and lines.

IEC Trend Report Relay protection for PEDGs:2025 | IEC

However, this transformation introduces significant challenges to grid stability, especially for relay protection technologies. Traditional relay protection often falls ineffective in power-electronics

Societal and technology trend report

Next, this framework is applied to two representative line-protection schemes – line distance protection and line differential protection – for quantitative evaluation under PEDG conditions.

Collection_vuSpec

This powerful collection contains over 184 IEEE Standards, Guides, and Recommended Practices, including Errata & Interpretations on Power Switchgear, Circuit Breaker, Fuse, Substation, and

Research on State Grid's technical specification system of relay ...

To the challenge relay protection faced during the process of smart substation development, State Grid Corporation of China has set a series of standards to lead its fast and normal development.

A review on adaptive power system protection schemes for future

This paper provides a state-of-the-art review of research efforts in the field of adaptive protection schemes, including the use of the IEC 61,850 protocol to incorporate automation

UNIFORM PROTECTION PROTOCOL

Protection protocol (1) All users connected to the integrated grid shall provide and maintain effective protection system having reliability, selectivity, speed and sensitivity to isolate faulty section and

Practical handbook-for-relay-protection-engineers | PDF

The handbook for protection engineers includes guidelines on protective circuitry, protective relay principles, and testing procedures for switchgear and relays. It covers standard codes, wiring

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

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

IEEE Power Systems Relays Standards Collection: VuSpec™

IEEE Power Systems Relays Standards Collection: VuSpec™ This VuSpec includes 47 active IEEE standards, guides, recommended practices in the Power Systems Relays family. Power System

SIPROTEC Protection Relays | Siemens

SIPROTEC: Multifunctional protection relays Experience the benchmark in grid protection, automation, and monitoring! SIPROTEC 5, built on extensive field experience, offers comprehensive

Protection relays

Protection relays Numerical relays are based on the use of microprocessors. The first numerical relays were released in 1985. A big difference between conventional electromechanical and static relays is

GB/T 14598.2-2025: Measuring relays and (PDF English)

The IEC 60255 series of standards specifies the technical requirements and power system solutions for measuring relays and protection devices, as well as related IEC 60255-1~IEC

GB/T 14598.2-2025: Measuring relays and (PDF English)

Steady state damp heat test (IEC 60068-2-78.2012, IDT) IEC 60255-21-1 Electrical relays Part 21. Vibration, shock, impact and seismic tests on measuring relays and protection devices Part

Standardization of relays and protection in smart grid

With the development of smart grid, the standardization of relays and protection will face great challenges and development opportunities.

Relay protection for power-electronics-dominated power grids:

However, this transformation introduces significant challenges to grid stability, especially for relay protection technologies. Traditional relay protection often falls ineffective in power-electronics

Protecting the Core: Securing Protection Relays in Modern Substations

Introduction — Why Securing Protection Relays Matters More Than Ever Substations are critical nexus points in the power grid, transforming high-voltage electricity to ensure its safe and

National Grid Design Handbook dh01 | PDF | Relay

National Grid Design Handbook dh01 - Free download as PDF File (.pdf), Text File (.txt) or read online for free. The document provides guidance for suppliers on asset replacement projects

GB/T 40584-2021: Technical specification for setting ... (PDF English)

Relay protection setting calculation software and data technical specifications. This document specifies the technical requirements for the function, data and interaction of the relay

Centralized Substation Protection and Control

Finally the report concludes that CPC technology, when appropriately applied, significantly improves the reliability of protection and control systems and the power grid at an affordable cost - with enhanced

Smart Grid Relay Protection Standards

The prominent characteristic of Smart Grid is the ability of To prepare international standards for measuring relays and protection equipment used in the various fields of electrical

New development in relay protection for smart grid

Abstract This series of papers report on relay protection strategies that satisfy the demands of a strong smart grid. These strategies include ultra-high-speed transient-based fault discrimination, new co

SOUTHERN REGIONAL POWER COMMITTEE BENGALURU

All users connected to the integrated grid shall provide and maintain effective protection system having reliability, selectivity, speed and sensitivity to isolate faulty section and protect element(s) as per the

Relay protection for power-electronics-dominated power grids:

Recognizing the dire need for advanced relay protection, this report presents a comprehensive analysis of the evolving landscape. It outlines technical challenges, potential innovative solutions, equipment

GB/T 40584-2021: Technical specification for setting ... (PDF English)

Technical specification for setting calculation software and data of relay protection
ICS 29.240.99 CCSF21 National Standards of People's Republic of China Relay
protection setting

Protective Relaying Philosophy and Design Guidelines

SECTION 1: Introduction Introduction This document supplements PJM Manual 07
which contains the minimum design standards and requirements for the protection
systems associated with the bulk

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://lwazipm.co.za>

Email: info@lwazipm.co.za

Phone: +27 82 415 6392

Address: 15 Oxford Street, Rosebank, Johannesburg, 2196, South Africa

This document is for informational purposes only. Specifications subject to
change without notice.

