New Standards for Relay Protection



Overview

In view of the trends in power grids and the new challenges they present, it is imperative to raise the standards for protection and control systems.

Key Takeaways

Modern relay protection standards focus on reliability, speed, coordination, and adaptation to power-electronics dominated grids, guided by IEEE C37. 113-2025 and IEC 60255-1: 2022. Key International StandardsIEEE C37.

113-2025 provides guidance for AC transmission line protection, covering relay characteristics, coordination of settings, operating times, mutual line coupling, and communication channel use. It helps engineers select and apply relays effectively to protect transmission lines while ensuring system stability and reliability.

IE

C 60255-1: 2022 specifies common rules and requirements for measuring relays and protection equipment, including distributed protection schemes, control, monitoring, and process interface equipment. This standard ensures uniformity in testing, safety, and electromagnetic compatibility across modern relay technologies, including numerical and multifunctional devices.

Emerging Trends and Challenges

The global energy transition and integration of renewable sources have led to power-electronics dominated grids (PEDGs). Traditional relay protection may be less effective in these systems, increasing the risk of mis-operation.

IE

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C trend reports highlight the need for advanced protection strategies, updates to IEC 61850, and development of AI-based verification standards to maintain grid stability.

Practical Guidance for Engineers

Practical handbooks emphasize: Relay selection and coordination for generators, transformers, lines, and capacitor banks. Testing and commissioning procedures, including station battery management and breaker trip circuits. Relay functional requirements: reliability, sensitivity, speed, and discrimination between fault and normal conditions.

Types of relays: current, voltage, impedance, power, frequency, differential, directional, and distance relays, with definite-time, inverse-time, and logic-based characteristics.

Summary

Modern relay protection standards combine established principles with advanced numerical and multifunctional devices, ensuring fast, reliable, and coordinated fault isolation. Engineers must consider emerging grid architectures, renewable integration, and AI-assisted verification to maintain system stability and compliance with IEEE and IEC standards.

Article Content

Societal and technology trend report

In view of the trends in power grids and the new challenges they present, it is imperative to raise the standards for protection and control systems. technological innovation and strategic optimization are

C37.90.1-2024

This standard specifies design tests for relays, relay systems, and control devices used for the protection and control of electric power apparatus that relate to the immunity of this equipment to repetitive

Power System Protective Relays: Principles & Practices

As the protected components of the electrical systems have changed in size, configuration and their critical roles in the power system supply, some protection aspects need to be revisited (i.e. the use of

IEC 60255 1xx: Protection relay functional standards for all

The International Electrotechnical Commission (IEC) is currently working on a new series of standards that covers the functional requirements of measuring relays and related equipment used

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"IEC 2025: Relay Protection for Power-Electronics Grids"

Explore the future of relay protection in power-electronics-dominated grids. Discover challenges, solutions, and opportunities in this free IEC report.

The Current Situation and Emerging Trends in Relay Protection

Explore the latest trends in relay protection, including innovations in relay test set technology, the shift to digital relays, and tools like the secondary injection test set. Learn how these

IEC 60255 1xx: Protection relay functional standards for all

To meet this need, the IEC is currently working on the IEC 60255-1xx series of functional standards dedicated to protection relays and protection functions. Before looking at the benefits...

Practical handbook for relay protection engineers | EEP

This handbook covers the code of practice in protection circuitry including standard lead and device numbers, mode of connections at terminal strips, colour codes in multicore cables, dos

NOTICE OF NEW STANDARD PRODUCTS

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

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

SEG Electronics

SEG WIC1 g2 selfpowered Protection Relay – Now KEMA certified! Our ultra fast, ultra safe and ultra reliable self-powered protection relay „WIC1 g2“ has now

C37.113-2015

Information on the concepts of protection of ac transmission lines is presented in this guide. Applications of the concepts to accepted transmission line-protection schemes are also

IEC 60255 1xx: Protection relay functional standards for all

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The new protection relay functional standards are designated as the IEC 60255-1xx series. The standardisation of various test methodologies and measurement metrics promises

Products under Compulsory Certification

BIS certification scheme is basically voluntary in nature. However, for a number of products compliance to Indian Standards is made compulsory by the Central Government under

IEEE Standard for Protection Relays: Complete Guide

The IEEE standard for protection relays defines the essential requirements for designing, testing, and ensuring reliable performance of

PC37.113/D3.5, Sept 2024

Scope: Concepts and applications of AC transmission line protection are presented in this guide. Many important issues, such as coordination of settings, operating times, characteristics of relays, mutual

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 Relay Testing

Reliably working protection relays are key in modern energy systems. Read on to learn about best practices, challenges, and trends in protection testing.

Contact Us

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Website: https://cgweb.co.za
Technical inquiry: https://cgweb.co.za/project-enquiry.html

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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