

Design Requirements for Relay Protection of 35kV Substations



AI Overview

A 35kV substation relay protection system ensures rapid fault isolation, selective protection, and reliable operation through coordinated relays, CT/PT selection, and proper settings. Key Principles of Relay Protection Relay protection in a 35kV substation is designed to detect abnormal conditions and isolate only the faulted section to prevent equipment damage and maintain system stability. The main performance criteria include speed, selectivity, sensitivity, reliability, and security (). Relays must operate quickly to clear faults, detect even small or high-impedance faults, and avoid false trips during normal operation. Components of the Protection System Protective Relays: Act as decision-making devices, analyzing current and voltage signals to detect faults. Common types include overcurrent, differential, distance, and directional relays (). Current Transformers (CTs): Reduce high system currents to standardized secondary currents for relay measurement. Proper CT ratio selection ensures accurate relay operation (). Voltage Transformers (PTs): Step down system voltage to safe levels for relay input and measurement. Circuit Breakers: Physically interrupt fault currents when commanded by relays, typically operating within 3 cycles (). DC Battery Systems: Ensure relay operation during power loss. Relay Protection Calculations Designing a relay system requires precise calculations to determine relay thresholds and settings (): Current and Voltage Sensing: Calculate maximum load current, minimum fault current, and voltage levels to set relay sensitivity. Fault Level Calculations: Determine symmetrical and asymmetrical fault currents for single line-to-ground, line-to-line, and three-phase faults. Time-Dial Settings: Configure overcurrent relays to coordinate with downstream devices and ensure proper fault clearing times. Impedance Settings for...

Article Content

HV Substation Design: Applications and Considerations

THE DESIGN, TESTING, AND APPLICATION OF LIQUID-IMMERSED DISTRIBUTION, POWER, AND REGULATING TRANSFORMERS USING HIGH-TEMPERATURE INSULATION

35kV Power Substation Maintenance Guide

Depending on the design, this may include checking bushings, terminals, cooling systems, oil condition, and operating temperature. Because the transformer is one of the most important

Practical Design Rules for Protection System Engineers

I'm highly specialized in the design of LV/MV switchgear and low-voltage, high-power busbar trunking (<6300A) in substations, commercial buildings and industry facilities.

MV Protection Relay Market Size, Share, Growth

The MV Protection Relay Market size is expected to reach USD 4.6 billion in 2034 registering a CAGR of 5.1. This MV Protection Relay Market

Secondary Engineer – HV Substations (Protection, Control, SCADA ...

Job Summary The Secondary Engineer will be responsible for the engineering design review and implementation support of protection control SCADA Substation Automation Systems (SAS)

Protection Relay Manufacturers 2026: MV Selection Guide

Protection relay manufacturers serving utility and medium-voltage switchgear must deliver proven expertise across fault detection, communication

internship report of 220/132 kV substation | PDF

This document provides an overview of an industrial training report submitted by Shivam Upadhyay at the Uttar Pradesh Power Transmission Corporation Limited

National Grid Design Handbook dh01 | PDF | Relay

It covers various aspects of relay equipment, protection schemes, testing and commissioning. The guidance aims to clarify National Grid requirements and deliver a common

Hitachi Energy hiring Lead Engineer

Hitachi Energy is seeking a Senior Project Engineer – Protection & Control to support the design, engineering, and execution of complex substation projects. This role plays a key part in translating

35kV Indoor Epoxy Cast-Resin Current Transformer for Switchgear

LZZB8 / LZZBJ9-35/250(III) is an indoor epoxy cast-resin current transformer rated for 35kV / 40.5kV medium-voltage switchgear, used for accurate current measurement, energy metering, and relay ...

Design of 35kV Transmission Line Relay Protection.pdf

In this Project, I develop a Protection Scheme for Transmission Line Using Different Relay configurations. - Design-of-35kV-Transmission-Line-Relay

Six common bus configurations in substations up to 345 kV

Comparison of bus configurations This technical article explains six most common bus configurations used for distribution, transmission, or switching

In-Depth Schematic Analysis of the 1000A Low-Voltage Motor Control ...

LV Motor Control Center (MCC) Panel This technical article provides an in-depth engineering analysis of the 1000A Low Voltage Motor Control Center (MCC) panel for high-demand

Substation

A substation is a part of an electrical generation, transmission, and distribution system. Substations transform voltage from high to low, or the reverse, or

Oil-Immersed Current Transformers for 35kV AC Power Systems

□□ LJW1-35 and LJWD1-35KV Oil-Immersed Current Transformers are precision instrument transformers designed for accurate current measurement, revenue-grade metering, and reliable relay protection ...

JLS-35KV Oil-Immersed Combined Instrument Transformer

JLS-35KV Outdoor Oil-Immersed Three-Phase Combined Instrument Transformer is a compact, sealed oil-filled unit integrating two voltage transformers (V/V connected) and two current transformers for ...

Relay Protection in HV/MV Substations: Calculations, Settings ...

Effective relay protection in HV/MV substations requires a thorough approach encompassing calculations, precise settings, meticulous coordination, informed relay selection, and

Metal Enclosed Switchgear, Vacuum Fault Interrupter, 3-Ph, 3-Wire, 2

Designed for operation on 34.5kV systems with a maximum equipment voltage of 35kV, the switchgear features a 1200A copper main bus, an 18kA symmetrical interrupting rating, motor-operated

JDJ2-35 Voltage Transformers for 35kV AC Power Systems

These units deliver standardized secondary voltages proportional to primary system voltage, enabling safe interfacing with meters, relays, and SCADA systems in outdoor substations and distribution ...

[#mediumvoltage #switchgear #currenttransformer #powerdistribution # ...](#)

It delivers reliable current measurement, energy metering, and relay protection in switchgear, vacuum circuit breaker cabinets, and industrial distribution equipment. ⚙️ This CT features a ...

[What Is a Potential Transformer in a Substation? Working Principle ...](#)

Even if direct measurement were attempted, conventional meters and protection relays are not designed to accept transmission voltage at their terminals. They require a much lower and

[Electric Design of 35kV Substation | IEEE Conference Publication](#)

This paper made a design about a 35/10kV step-down substation according to the load of a town. The main technical focus is the primary electrical part design and a small part of the secondary design in

[33/11 kV Distribution Substation Components and Functions](#)

[Inside a 33/11 kV Distribution Substation: The Backbone of Reliable Power](#)
Distribution substations play a critical role in bridging the gap between high-voltage transmission networks and consumers ...

[Mobile Prefabricated Substation | Trailer Type | Fast Power Solution](#)

The Mobile Prefabricated Substation is a fully integrated, factory-assembled power solution designed for rapid deployment in emergency, temporary, or permanent power distribution applications. Built on a

[35kV Substation Electrical Design | PDF | Transformer](#)

The document then discusses the electrical main wiring designs for the substation, including selecting the main transformer capacity and type, designing the substation, and selecting a bus bar scheme.

[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

[Zig-Zag Grounding Transformer Guide: How It Works, Applications, Design](#)

Learn how a Zig-Zag Grounding Transformer works, its winding configuration, neutral grounding methods, fault protection, industrial power system.

[Protection Application Handbook](#)

The major requirements on protection relays are speed, sensitivity and selectivity. Fault calculations are used when checking if these requirements are fulfilled.

Contact Us

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