Sri Lanka Relay Protection Operation



Overview

Protection settings of relays at GSS and downstream ARs of selected GSS will be analyzed with the standards to determine the optimum co-ordination in MV level.

Key Takeaways

Relay protection in Sri Lanka ensures safe and reliable operation of the power system by detecting faults, coordinating protective devices, and minimizing service interruptions.

Overview of Relay Protection

Sri Lanka's power system operates with High Voltage (HV) transmission and Medium Voltage (MV) distribution, typically ranging from 132 kV down to 11 kV. Protective relays are critical for detecting transient (temporary) and permanent faults in the network. Transient faults, which account for over 80% of MV faults, are usually caused by lightning, tree contact, animals, or high winds and can often be cleared automatically without permanent damage.

Permanent faults, however, damage insulation and require repair before re-energization.

Protective Devices and Coordination



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Protective relays work in conjunction with circuit breakers (CBs) and auto-reclosers to isolate faults quickly. The coordination of relays involves setting the timing and sequence of operations to ensure that only the faulty section is disconnected, minimizing the number of customers affected and preventing damage to expensive equipment like transformers. For example, overcurrent (OC) and earth fault (EF) relays are used to protect transformers from through faults, with ANSI standards recommending clearing times of around 2 seconds to prevent overheating.

Applications in Power Plants and Substations

In power plants, intelligent motor protection relays such as the ARD2F are used to monitor motors for overload, phase loss, short circuits, and other abnormal conditions, providing real-time protection and control. At grid substations, relays are applied to 33 kV and 11 kV feeders, ensuring that faults are detected and cleared promptly. Temporary digital disturbance recorders are often used to analyze fault durations and improve relay settings.

Testing and Commissioning

Relay protection systems undergo primary injection testing to verify the performance of circuit breakers, auto-reclosers, and overcurrent devices up to 3000 A. Insulation resistance tests, earthing system checks, and high-voltage withstand tests are conducted to ensure compliance with IEEE and IEC standards. Electrical data logging, power quality analysis, and harmonic analysis are also performed to identify hidden issues and optimize protection settings.

Key Objectives

Minimize fault duration and service interruptions. Prevent damage to transformers, motors, and other critical equipment. Ensure coordination between upstream and downstream protective devices.

Enhance reliability of the MV and HV network for end users. Relay protection in Sri Lanka is therefore a combination of strategic device placement, precise timing coordination, and rigorous testing, ensuring the safe and continuous operation of the national power system.

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Article Content

Application of Intelligent Motor Protection relay in Sri Lanka Power Plant

In a power plant in Sri Lanka, we recommended our ARD2F series to the client. In the protection design of power plant motor equipment, the application and protection configuration of low-voltage motors

Analysis of protection coordination in MV distribution system of Sri Lanka

Protection settings of relays at GSS and downstream ARs of selected GSS will be analyzed with the standards to determine the optimum co-ordination in MV level. This study will

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By using the fault levels at the location of protective device, OC and EF characteristics curves were plotted. It is found that there is no sufficient grading margin between ARs and relays at GSS.

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FINDINGS OF THE COMMITTEE APPOINTED TO INVESTIGATE

We have determined that the combination of spurious operation of end-fault protection at Biyagama busbar and erroneous configuration of the line protection relay at Kotmale has been the principal

Protection 3-v2

This type of relay has a cylinder similar to a cup which can rotate in the air gap between the poles of the coils, and has a fixed central core. The operation is very similar to a two-phase induction motor with

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Widely used protection functions for MV network are OC protection and EF protection. The relays having OC and EF protection functions perform on different philosophies as mentioned below.

SELEC 900VPR VOLTAGE PROTECTION RELAY

SELEC 900VPR DIGITAL VOLTAGE PROTECTION RELAY Monitoring relay Features: Under voltage/Over voltage protection for 3-phase systems True RMS

IDENTIFICATION OF THE OPTIMUM PROTECTION

stem of Sri Lankan power system by analyzing the existing protection settings and behavior of MV network. Protection settings of relays at GSS and downstream A s of selected GSS will be analyzed

Optimum Protection Coordination in MV System

This document is a Master''s dissertation submitted by Lakmini Kumari Dissanayake to the University of Moratuwa in Sri Lanka in February 2015. The dissertation investigates protection coordination in the

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FINDINGS OF THE COMMITTEE APPOINTED TO INVESTIGATE

The operation of end-fault protection relay at Biyagama was not expected while the auto-reclosing was in progress. We have determined that the combination of spurious operation of end-fault protection at

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An automotive relay is an electrical switch that allows a low-current circuit to control a high-current circuit. It''s crucial for protecting sensitive electrical components, preventing overloads, and efficiently

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