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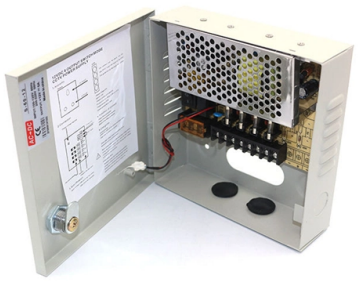
Relay protection fault phase selection



Overview

Fault type selection logic is discussed, and the evolution and improvement of faulted phase selection logic over several decades is demonstrated. A newer relay design, available since 1993, is proven to have improved performance, namely better security, for these. The misoperation can be attributed to incorrect fault type selection in a distance element-based, 1980s-era relay. Two separate events in different locations, one in December 2007 and another in March 2009, highlight additional incorrect operations that occurred due to the same problem and root. Selectivity is a mandatory requirement for all protection, but the importance of it depends on the application. For example, unselective protection operation during a medium voltage network fault will cause an outage for an unnecessarily large number of consumers. The most difficult fault type to identify correctly is a two-phase-to-ground fault. This document provides recommendations, background and philosophy on relay protection that is not available in M07. Faulty phase selection in transient based protection relays is considered to be very challenging as it requires making decisions within sub-cycle time period and while.

Article Content

Power System Protective Relays: Principles & Practices

They are intended to quickly identify a fault and isolate it so the balance of the system continue to run under normal conditions. The selection and applications of protective relays and their associated ...

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Abstract-- The reliable performance of faulted phase selectors to identify the faulted phase or phases and appropriately block or permit tripping is critical to the application of distance protection. The most ...

Basic protection relay knowledge

A fast and selective arc fault mitigation for air-insulated LV & MV switchgear and Relion protection and control relays and sensor technology protect staff and plant facilities for many years.

Protective Relaying Philosophy and Design Guidelines

In such schemes, only the faulted phase of the transmission line is opened for a phase-to-ground fault. Power can therefore still be transferred across the line after it trips over the two phases that remain in ...

Preparation of Papers in a Two-Column Format

Types of decisions made in a transient based protection relay includes detecting the presence of a fault, identifying the phases involved in the fault, and making sure that the fault is within the protected zone.

Faulted phase selection function based upon impedance ...

In this paper, we propose a unique method to enhance the faulted phase selection function that uses impedance.

Line Distance Protection overreaching

A description and review of the principles related to phase selectors and directional elements will be presented. In addition, the fault conditions that could lead to a relay mal operation if either of these ...

Determining the Faulted Phase

The fault type selection process of the modern relay is summarized in Table II. Fig. 11 and Fig. 12 are graphical representations of the phase angle sectors identified and used by the modern ...

Fault zone identification and phase selection for microgrids using ...

Fault zone identification and phase selection are among protection challenges that existing protection schemes fail to address. This paper proposes a voltage-restrained classifier-based ...

Distance Relay Element Design

We present a solution to this problem which compares ground and phase fault-resistance estimates. Phase angle comparators test the angle between various voltage and current combinations to ...

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