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IEEE Guide for Protection of Secondary Network Systems

IEEE STANDARDS

IEEE Power and Energy Society

Developed by the
Power System Relaying and Control Committee

IEEE Std C37.108™-2021
(Revision of IEEE Std C37.108-2002)

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Abstract: Current available devices that are being used in secondary network systems protections schemes are covered in this guide. These devices act to sense the fault and initiate fault interruption locally or remotely, thereby minimizing damage and restoration time.

Keywords: IEEE C37.108, master relay, network limiter, network protector, network relays, network transformers, spot networks

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Introduction

This introduction is not part of IEEE Std C37.108–2021, IEEE Guide for Protection of Secondary Network Systems.

This guide is intended to aid in the effective application of relays and other devices for the protection of power transformers in network transformer vaults. This is a revision to the 2002 guide. An emphasis added on the protection of secondary network systems as opposed to just network transformer only in this 2021 revision. Several updates in regard to IEEE new style/word usage are applied. Normative references (adding new relevant available standards) and definitions are updated. The order and main content of most of the clauses remain the same but modernized to current technology. Clarifications are added where needed in the figures and annexes. Removals of copy of paragraph from different IEEE documents are done. Instead, we refer to where this topic can be found as a reference. Lastly, sections that are not in the scope of the guide have been removed (SCADA and Distributed Source Generation).

Network distribution systems differ from radial distribution systems due to several factors. These factors include: high-fault currents on the low-voltage side of the transformers, possible frequent operation of network protectors, varying practices of providing dedicated high-voltage transformer protection, confined spaces, backfeed issues, and proximity to dense public populations in city streets and office buildings.

Protection techniques presented in this guide will help minimize the effects and damage caused by network faults. Important issues covered in other appropriate publications include the following items:

a) It is important that vault and equipment design, construction, operation, and maintenance conform to applicable standards and regulations, including company, municipal, state, and country operating rules.

b) Always use manufacturers' recommended operating and maintenance procedures.

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IEEE Guide for Protection of Secondary Network Systems

1. Overview

1.1 Scope

This guide covers devices that are being used in secondary network systems protection schemes. These devices act to sense the fault and initiate fault interruption locally or remotely, thereby reducing damage and restoration time.

1.2 Purpose

This guide is intended to aid engineers who design protection of secondary network systems.

1.3 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (*shall* equals is *required to*).[1,2]

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (*should* equals is *recommended that*).

The word *may* is used to indicate a course of action permissible within the limits of the standard (*may* equals is *permitted to*).

The word *can* is used for statements of possibility and capability, whether material, physical, or causal (*can* equals is *able to*).

1.4 General

Network transformer vaults are fire retardant enclosures normally within or adjacent to buildings or underneath streets and alleys. They typically contain two or more power transformers. These transformers are supplied from different subtransmission or distribution lines and are paralleled on their low-voltage side through circuit

[1]The use of the word *must* is deprecated and cannot be used when stating mandatory requirements, *must* is used only to describe unavoidable situations.
[2]The use of *will* is deprecated and cannot be used when stating mandatory requirements, *will* is only used in statements of fact.