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IEEE Guide for the Design and Installation of Cable Systems in Substations

IEEE Power and Energy Society

Sponsored by the
Substations Committee

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USA

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Abstract: The design, installation, and protection of wire and cable systems in substations are covered in this guide, with the objective of minimizing cable failures and their consequences.

Keywords: acceptance testing, cable, cable installation, cable selection, communication cable, electrical segregation, fiber-optic cable, handling, IEEE 525™, power cable, pulling tension, raceway, recommended maintenance, routing, separation of redundant cable, service conditions, substation, transient protection

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Introduction

This introduction is not part of IEEE Std 525™-2016, IEEE Guide for the Design and Installation of Cable Systems in Substations.

This revision of the guide makes the following changes:

— Annex P was added to describe a large station example.

— Annex Q was added to provide information on fiber optic cables.

— The communications cable information was expanded throughout the document.

— Miscellaneous updates were made throughout the document.

Contents

IEEE Guide for the Design and Installation of Cable Systems in Substations

1. Overview

The main clauses of the guide are organized by cable type and each of these clauses has been organized to match the general steps involved in the design process for a substation cable system (see Annex A for a flowchart diagram). Common information for each type of cable is placed in the annexes and is referenced from the body of the guide. The rationale for organizing the guide in this manner is to make it easier for the user to find the information needed as quickly and efficiently as possible, especially for those individuals unfamiliar with the design of cable systems in substations.

1.1 Scope

This document is a guide for the design, installation, and protection of insulated wire and cable systems in substations with the objective of helping to minimize cable failures and their consequences. Cable systems with voltages greater than 35 kV are not covered in this guide.

1.2 Purpose

The purpose of this guide is to provide guidance to the substation engineer in established practices for the application and installation of metallic and optical cables in electric power transmission and distribution substations with the objective of helping to minimize cable failures and their consequences. This guide emphasizes reliable electrical service and safety during the design life of the substation.