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IEEE Guide for the Design of Low-Voltage Auxiliary Systems for Electric Power Substations

IEEE Power and Energy Society

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IEEE Guide for the Design of Low-Voltage Auxiliary Systems for Electric Power Substations

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of the
IEEE Power and Energy Society

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Abstract: Considered in this guide are the components of both the ac and dc systems and the provided guidelines and recommendations for designing the appropriate systems for the substation under consideration. This guide includes the low-voltage auxiliary systems from the source(s) to the distribution point(s). Reliability requirements and load characteristics are discussed and distribution methods are recommended.

Keywords: ac system, auxiliary systems, battery, dc system, IEEE 1818, low voltage, station power, station service

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Introduction

This introduction is not part of IEEE Std 1818-2017, IEEE Guide for the Design of Low-Voltage Auxiliary Systems for Electric Power Substations.

IEEE Guide 1818 was created by members of Working Group D9 and is under the sponsorship of the Substations Committee of the IEEE Power & Energy Society. This guide provides guidance and information to substation engineers on factors to consider in the design of ac and dc auxiliary systems for application in electric substations. This guide references several existing standards and is not intended to replace existing documentation, but to provide guidance for the application of ac and dc systems specifically in substation applications.

Acknowledgment

The D9 Working Group would like to acknowledge Chuck Haahr for his fine work as technical editor.

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1.1 Scope

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1.2 Purpose

The low-voltage ac and dc auxiliary systems comprise very important parts of the substation equipment. The design of the ac and dc auxiliary systems facilitates the safe and reliable operation of the substation. This guide considers various factors that affect the design of the ac and dc auxiliary systems such as reliability, load requirements, system configurations, personnel safety, and protection of auxiliary systems equipment.

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

IEEE Std 485™, IEEE Recommended Practice for Sizing Lead-Acid Batteries for Stationary Applications.[1,2]

IEEE Std 525™, IEEE Guide for the Design and Installation of Cable Systems in Substations.

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