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IEEE Guide for Gas-Insulated Substations Rated Above 52 kV

IEEE Power and Energy Society

Sponsored by the
Substations Committee

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USA

IEEE Std C37.122.1™-2014
(Revision of
IEEE Std C37.122.1-1993)

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Abstract: Information of special relevance to planning, design, testing, installation, operation and maintenance of gas-insulated substations (GIS) and equipment is provided in this guide, which is intended to supplement IEEE Std C37.122™.

This guide is applicable to all gas-insulated substations (GIS) above 52 kV. However, the importance of topics covered varies with application category. For example, the issues related to advanced field test techniques and very fast transients (VFT) are of particular interest for extra-high voltage (EHV) gas-insulated substations (GIS).

Keywords: gas-insulated metal enclosed switchgear, gas-insulated substation, gas-insulated switchgear, GIS, GIS design, GIS equipment, GIS installation, GIS testing, IEEE C37.122™, SF_6, sulfur hexafluoride, VFT, very fast transient, partial discharge, PD

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Introduction

This introduction is not part of IEEE Std C37.122.1™-2014, IEEE Guide for Gas-Insulated Substations Rated Above 52 kV.

IEEE Std C37.122™-1983 was initiated in the early 1970's when the first gas-insulated substations (GISs) were introduced. The reliability of GISs has improved greatly since the first installations. Utilities have taken advantage of the greater flexibility offered by GISs to locate substations closer to load centers with considerable savings in transmission system costs and reduced system loses. In addition, a GIS typically offers 20 years or more of operation before major overhaul is required.

During the Working Group and Subcommittee deliberations on the 1993 revision, it was recognized that users would be better served if the original document was divided in two, becoming IEEE Std C37.122™ [a] (a standard) and IEEE Std C37.122.1™ (a guide). The two documents can be referred to individually or jointly depending on the purpose.

This is the guide's first major revision since it was published. This is a general update based on the latest technology and user experience.

The subcommittee would like to acknowledge CIGRE for allowing the use of sections of CIGRE 125 [B12][b] for this guide.

The subcommittee would like thank the International Electrotechnical Commission (IEC) for permission to reproduce Information from its International Publication IEC 62271-203 ed.2.0.

[a] Information on references can be found in Clause 2.
[b] The numbers in brackets correspond to those of the bibliography in Annex A.

Contents

IEEE Guide for Gas-Insulated Substations Rated Above 52 kV

1. Scope

This guide provides information of special relevance to planning, design, testing, installation, operation and maintenance of gas-insulated substations (GISs) and equipment. This guide is intended to supplement IEEE Std C37.122™ [1].

This guide is applicable to all GISs above 52 kV. However, the importance of topics covered varies with application category. For example, the issues related to advanced field test techniques and very fast transients (VFT) are of particular interest for extra-high voltage (EHV) GISs.

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.

ASTM D2472-00 Standard Specification for Sulfur Hexafluoride.[2]

CIGRE 69-1992, General Guidelines for the Design of Outdoor AC Substations.[3]

[1] Information on references can be found in Clause 2.
[2] ASTM publications are available from the American Society for Testing and Materials, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, USA (http://www.astm.org/).
[3] CIGRE publications are available at http://www.e-cigre.org/.