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IEEE Guide to Specifications for Gas-Insulated Substation Equipment

Sponsor
Substations Committee
of the
IEEE Power Engineering Society

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Abstract: IEEE C37.123-1991 covers the technical requirements for the design, fabrication, testing, and installation of a gas-insulated substation (GIS); its intent is advisory. This guide discusses parameters to be supplied by the purchaser and technical requirements for the design, fabrication, testing, and installation to be furnished by the manufacturer. Environmental conditions, general and specific equipment requirements, and a proposal data sheet form are included to aid the user.

Keywords: gas-insulated substation, GIS, GIS equipment, GIS testing, GIS design, GIS installation

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Foreword

(This Foreword is not a part of IEEE C37.123-1991, IEEE Guide to Specifications for Gas-Insulated Substation Equipment.)

This guide is issued to aid users in developing and preparing specifications for gas-insulated substations and equipment; its intent is advisory. The guide covers parameters to be supplied by the purchaser and technical requirements for the design, fabrication, testing, and installation to be furnished by the manufacturer. The purchaser should revise any paragraph as appropriate, delete any paragraph that does not apply to his or her needs, and incorporate any details to make the specification conform to his or her standard practices and requirements.

Proposal Data of Section 4, which should be completed by each bidding manufacturer, is provided in order to elicit uniform answers from all the providers and to facilitate technical proposal evaluation.

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IEEE Guide to Specifications for Gas-Insulated Substation Equipment

1. Introduction

1.1 Scope

1.1.1 This guide covers the technical requirements for the design, fabrication, testing, and installation of a gas-insulated substation (GIS).

1.1.2 The manufacturer shall furnish all work necessary to provide the complete GIS as shown on the functional one-line diagram, which may consist of circuit breakers (CB), disconnect switches (DS), maintenance ground switches (MGS), fast-acting ground switches (FGS), voltage transformers (VT), current transformers (CT), SF₆-to-air bushings, buses, cable pothead enclosures, transformer or reactor bushing enclosures, enclosed surge arresters, elbows, bellows, controls, and supporting structures in applicable numbers. All equipment and material shall be prefabricated, factory assembled, tested, and shipped in the largest practical assemblies.

1.1.3 The assembled equipment shall be capable of withstanding electrical, mechanical, and thermal ratings of the specified system. All joints and connections shall be able to withstand the forces of expansion, vibration, contraction, and specified seismic requirements without deformation, malfunction, and leakage.

1.1.4 The equipment shall be capable of withstanding the specified outdoor or indoor environment.

1.1.5 Optimized arrangements are required to reduce installation time, provide ease of operations, minimize maintenance and repair costs, and facilitate future additions as described in the specifications. The proposal shall include recommended spare parts for reduced outage time in case of a fault, and delivery time in case of emergency.

1.1.6 Field assembly costs and maintenance costs will be considered in bid evaluations.

1.1.7 In order to elicit a complete and uniform response from each bidder, Section 4, Proposal Data, is provided.

1.2 References

1.2.1 This guide shall be used in conjunction with the following publications. When the following standards are superseded by an approved revision, the revision shall apply.

[1] ANSI A14.3-1984, American National Standard Safety Requirements for Fixed Ladders.¹

[2] ANSI B18.12-1962 (Reaff. 1981), American National Standard Glossary of Terms for Mechanical Fasteners.

[3] ANSI C2-1990, National Electrical Safety Code.

[4] ANSI C37.06-1987, American National Standard AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis—Preferred Ratings and Related Required Capabilities.

[5] ANSI C37.11-1979, American National Standard Requirements for Electrical Control for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis or a Total Current Basis.

¹ANSI publications are available from the Sales Department, American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036, USA.