

TECHNICAL REPORT



High-voltage direct current (HVDC) systems – Guidebook to the specification and design evaluation of A.C. filters

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**High-voltage direct current (HVDC) systems – Guidebook to the specification
and design evaluation of A.C. filters**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**HIGH-VOLTAGE DIRECT CURRENT (HVDC) SYSTEMS –
GUIDEBOOK TO THE SPECIFICATION AND
DESIGN EVALUATION OF A.C. FILTERS**

FOREWORD

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- amended.

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IEC TR 62001:2009

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HIGH-VOLTAGE DIRECT CURRENT (HVDC) SYSTEMS – GUIDEBOOK TO THE SPECIFICATION AND DESIGN EVALUATION OF A.C. FILTERS

1 Scope

This technical report deals with the specification and design evaluation of a.c. side harmonic performance and a.c. side filters for high-voltage direct current (HVDC) schemes. It is intended to be primarily for the use of the utilities and consultants who are responsible for issuing the technical specifications for new HVDC projects and evaluating designs proposed by prospective suppliers.

The scope of this technical report covers a.c. side filtering for the frequency range of interest in terms of harmonic distortion and audible frequency disturbances. It excludes filters designed to be effective in the Power Line Carrier (PLC) and radio interference spectra.

The bulk of the document concentrates on the “conventional” a.c. filter technology and current-source line-commutated HVDC converters. Discussion of the changes entailed by new technologies is treated exclusively in Clause 20. Other unusual applications, such as series filters, which use conventional technology but are only employed in very specific circumstances, are discussed in Clause 13.

The term “technical report” or “report” used in this document is taken to mean the document which defines the overall system requirements for the a.c. filters and the a.c. system environment in which they have to operate. Such a document is normally issued by utilities to the prospective HVDC manufacturers. It also ensures the uniformity of proposals and sets guidelines for the evaluation of bids. The term as used here does not refer to the detailed engineering specifications relating to individual items of equipment, which are prepared by the HVDC manufacturer as a result of the filter design process.

The technical report defines the technical basis for a contract between two parties, who in this document will be referred to as the “customer” and the “contractor”.

- The “customer” is the organisation which is purchasing the HVDC converter station, including the a.c. filters. The term “customer” is taken to cover similar terms which may be used in specifications, such as owner, client, buyer, utility, user, employer and purchaser, and also covers a consultant representing the customer.
- The “contractor” has the overall responsibility for delivery of the HVDC converter station, including the a.c. filters, as a system, and may in turn contract one or more sub-suppliers of individual items of equipment. The term “contractor” is taken to cover similar terms which may be used in specifications, such as manufacturer, or supplier.

Where the context clearly refers to the pre-contract stage of a project, the word “bidder” has been used instead of “contractor”, to indicate a prospective contractor, or tenderer.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60076-6:2007, *Power transformers – Part 6: Reactors*