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BSI Standards Publication

Reliability and availability evaluation of HVDC systems

Part 1: HVDC systems with line commutated converters

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee PEL/22, Power electronics.

A list of organizations represented on this committee can be obtained on request to its secretary.

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FOREWORD

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC/TS 62672-1, which is a technical specification, has been prepared by IEC technical committee 115: High voltage direct current (HVDC) transmission for DC voltages above 100 kV.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
115/68/DTS	115/75/RVC

Full information on the voting for the approval of this technical specification can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

Annexes A and B are for information only.

A list of all parts in the IEC 62672 series, published under the general title *Reliability and availability evaluation of HVDC systems*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

RELIABILITY AND AVAILABILITY EVALUATION OF HVDC SYSTEMS –

Part 1: HVDC systems with line commutated converters

1 Scope

This part of IEC 62672 applies to all line-commutated high-voltage direct current (HVDC) transmission systems used for power exchange in utility systems. HVDC stations with voltage sourced converters (VSC) are not covered.

In order to assess the operational performance of HVDC transmission systems, reliability and availability need to be evaluated. For this purpose the HVDC users/owners are encouraged to compile reports on an annual basis based on the recommendations given in this Technical Specification. The purpose of this part of IEC 62672 is to define a standardized reporting protocol so that data collected from different HVDC transmission systems can be compared on an equitable basis. It is recommended that such reports are sent to Cigré SC B4, “HVDC and Power Electronics” (http://b4.cigre.org) who collects such data and publishes a survey of HVDC systems throughout the world on a bi-annual basis.

This part of IEC 62672 covers point-to-point transmission systems, back-to-back interconnections and multi-terminal transmission systems. For point-to-point systems and back-to-back interconnections, i.e. two-terminal systems, statistics are to be reported based on the total transmission capability from the sending end to the receiving end measured at a given point. If, however, the two terminals are operated by different users/owners, or are composed of equipment of different vintage or of equipment from different suppliers, statistics can be reported on an individual station basis if so desired by those responsible for reporting. In such a case, the outage should only be reported under the originating converter station taking care not to report the same event twice. For distributed multi-terminal systems, i.e. systems with more than two terminals, statistics are to be reported separately for each converter station based on its own individual capability.

Multi-terminal systems, incorporating parallel converters but having only two converter stations on the d.c. line, can be considered as either point-to-point systems or as multi-terminal systems for purpose of reporting. Therefore, statistics for this special type of multi-terminal system can be reported based on either total transmission capability or on individual station capability. If the converters at one station use different technology, converter station statistics can be reported separately for each different type of capacity if desired. Multiple bipoles are also to be reported individually. Special mention should be given in the text and in the tabulations to any common events resulting in bipolar outages.

NOTE Usually the agreement between the purchaser and the turnkey suppliers of the HVDC converter station includes specific requirements regarding contractual evaluation. Such specific requirements will govern over this Technical Specification.

2 Normative references

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

IEC 60633:1998, *Terminology for high-voltage direct current (HVDC) transmission* Amendment 1:2009