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**NATIONAL STANDARD OF THE
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AC filters for HVDC systems

高压直流系统交流滤波器

(English Translation)

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Foreword

This standard corresponds to IEC/PAS62001.2004 "HVDC AC filter specifications and design of assessment guidelines" (first edition).

The Standard and IEC/PAS62001.2004 non-equivalent degree of consistency, the main differences are as follows.

--- According to GB/T 1.1-2000, revised IEC/PAS62001.2004 choreography format and language expression. This standard clauses Number and IEC/PAS62001.2004 do not

correspond;

- Remove the preface of international standards, increase the standard of this preface;
- Remove the IEC/PAS62001.2004 Chapter 4, Chapter 5, Chapter 8, Chapter 12, Chapter 19 of the content;
- Remove the IEC/PAS62001.2004 with 60Hz-related content;
- Introduction of this standard corresponds to IEC/PAS62001.2004 Chapter 1, Chapter 2;
- The standard 5.1 corresponds to IEC/PAS62001.2004 is 2.3, 5.2 corresponds to IEC/PAS62001.2004 Chapter 3, 5.3 corresponds to IEC/PAS62001.2004 Chapter 11, 5.4 corresponds to IEC/PAS62001.2004 Chapter 13, 5.5 pairs Corresponding to IEC/PAS62001.2004 Chapter 14, 5.6 corresponds to IEC/PAS62001.2004 Chapter 15;
- Chapter 6 of this standard corresponds to IEC/PAS62001.2004 and the 17.2.4, 17.3.4, 17.4.4, 17.5.4, 17.6.2.3 17.7.4;
- The standard Chapter 7 corresponds to IEC/PAS62001.2004 Chapter 18;
- The standard of 8.1 corresponds to IEC/PAS62001.2004 17.1;
- The standard 8.2 corresponds to IEC/PAS62001.2004 and the 17.2.3, 17.3.3, 17.4.3, 17.5.3, 17.6.2.2 17.7.3;
- Increased in Chapter 9 of this standard;
- Appendix A of this standard corresponds to IEC/PAS62001.2004 of 6.2 and 6.6;
- Appendix B of this standard corresponds to IEC/PAS62001.2004 Chapter 7;
- The Standard Appendix C corresponds to IEC/PAS62001.2004 Chapter 9, Chapter 10;
- To adopt the IEC/PAS62001.2004 contents were modified and deleted;
- To adopt the IEC/PAS62001.2004 Formula legend and rearrange.

The Standard Appendix A, Appendix B and Appendix C are informative appendices.

The standard proposed by China Electrical Equipment Industrial Association.

This standard by the National Standardization Technical Committee on Electronic electrodynamic (SAC/TC60) centralized.

Introduction

HVDC converter station in what way they affect the quality of power supply system is usually a major problem, a power quality the main problem is harmonic.

HVDC converter AC side current waveform is non-sinusoidal, the current flowing into the AC system connected thereto, may produce unacceptable Subject to voltage distortion. In

order harmonic distortion AC side current and voltage is reduced to an acceptable level, we need to install a filter on the AC side.

HVDC converter consumes considerable reactive power. AC filter as the capacitive fundamental reactive power source, in addition to filtering, but also to compensate for change most or all of the reactive power flow consumed. You may also use additional shunt capacitors and reactors to ensure compliance Under the given operating conditions capable of reactive power balance maintained within a predetermined range.

Converter Station AC filter (including shunt capacitor, if applicable) of the fundamental reactive power rating of the DC system is generally designed for rated output Get 50% to 60% capacity. Manufacturing, installation and commissioning of the equipment cost AC filter large, usually accounts for 10% of the total cost of the converter station about. Range filter design study is fairly broad, if designed properly, will give the operation and maintenance of great inconvenience. Thus shall AC filter design must be optimized, while meeting filtering performance and reactive power balance requirements.

This standard aims to.

- For HVDC converter stations AC filter design and test to provide guidance to determine the need to purchase equipment, technical characteristics;
- So that the converter station and communication system design is consistent to some extent;
- Ensure compatibility HVDC systems running various aspects;
- Provide guidance for tendering and bidding specification design evaluation.

The basic criteria for judging standard filter performance meets are.

- Using a predetermined data, confirmed by performance parameter calculation;
- After commissioning field measurements.

Before using this standard, you should do some research and related filter.

- AC system reactive power requirements;
- AC system impedance measured or calculated;
- AC system harmonic background level.

Research conducted by the contractor to include.

- Provide reactive power and control;
- AC systems with low harmonic resonance;
- AC filter performance;

- AC filter steady ratings;
- Rating AC filter transient overvoltage and insulation coordination;
- AC filter losses;
- AC filter protection;
- AC filter type circuit breaker;
- AC filter discharge requirements;
- Control and dynamic properties of partially affected by the AC filter, as well as the overall operation of the exchange and analysis of HVDC systems;
- AC filter part by the impact of audible noise research;
- Affected by the AC filter section (reliability, availability and serviceability) study.

Engineering design and procurement phase, the general contractor on the completion of the design aspects of filter (performance rating, the circuit structure, protection, insulation with layout, reliability and availability) of technical studies and other documents, as well as the technical specifications of the sub filter device.

HVDC AC filter

1 Scope

This standard specifies the $\pm 800\text{kV}$ and below voltage DC transmission project on the AC side filter design, testing, site survey and security Loaded content maintenance and other aspects.

This standard takes into account only the AC side harmonic distortion and audio interference filter in the frequency range that does not involve power system for filtering carrier (PLC) and radio frequency interference band harmonic filters.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard.

GB 1207-2006 electromagnetic voltage transformer (IEC 60044-2:2003, MOD) GB 1208-2006 current transformers (IEC 60044-1:2003, MOD) GB 1984-2003 high voltage AC circuit breaker (IEC 62271-100:2001, MOD) GB 1985-2004 high-voltage AC disconnectors and earthing switches (IEC 62271-102:2002, MOD) GB 10229-1988 Reactor (eqv IEC