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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB 1094.5-2008

Replacing GB 1094.5-2003

Power transformers -- Part 5: Ability to withstand short circuit

电力变压器 第5部分：承受短路的能力

(English Translation)

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A. 1 Scope

A. 2 Overview

Foreword

Part of Chapters 3 and 4 are mandatory, the rest are recommended.

GB 1094 "Power Transformers" currently contains the following sections.

--- Part 1. General;

--- Part 2. temperature rise;

--- Part 3. Insulation levels, dielectric tests and external insulation air gap;

--- Part 4. Power transformers and reactors lightning impulse and switching impulse testing guidelines;

--- Part 5. ability to withstand short circuit;

--- Part 7. oil-immersed power transformer loading guidelines;

--- Part 10. Determination of sound levels;

--- Part 10.1. Determination of sound levels --- Application guide;

--- Part 11. Dry-type transformers.

This section GB 1094 Part 5.

The partial modification using IEC 60076-5:2006 "Power transformers Part 5. Ability to

withstand short circuit" (in English).

This section according to IEC 60076-5:2006 modifying the principles adopted by redrafting.

Taking into account China's national conditions, in using IEC 60076-5:2006 when this part has made several modifications. About the technical differences have been incorporated into positive this paper identifies and vertical single line in which they are involved with the provisions margin. This part of IEC 60076-5:2006 Main technical Differences are as follows.

- Cited international standards of our standards, rather than a direct reference to international standards;
- Considering the circumstances of the transformer short-circuit impedance values in Table 1. 3.2.2.3 Added "Note 3. The different rated capacity and Specific short-circuit impedance voltage level value, see the appropriate standard. ";
- Taking into account the specific circumstances of the grid system, the equipment 3.2.2.4 Table 2 the highest voltage and short circuit according to China's apparent capacity the actual situation of the grid voltage levels are listed, and the IEC 60076-5:2006, the corresponding provisions listed in Appendix B to facilitate Control.

For ease of use, this section of IEC 60076-5:2006 made the following editorial changes.

- Remove the IEC 60076-5:2006 Foreword;
- Appendix A Note 1 The contents moved footnote 7);
- With a decimal point "." Instead of a comma as the decimal point "." this Part replaces GB 1094.5-2003 "Power transformers Part 5. Ability to withstand short circuit." this section compared with GB 1094.5-2003 main changes are as follows.
- Added "normative references";
- Added "System Short nominal system voltage of 750kV apparent capacity";
- Increase the "ability to withstand short-circuit dynamic stability theory assessment" informative appendix.

This section of the Appendix A, Appendix B and Appendix C are informative appendices.

This part is proposed by the China Electrical Equipment Industrial Association.

This part of the National Standardization Technical Committee transformers (SAC/TC44) centralized.

This section is drafted. Shenyang Transformer Research Institute, TBEA Shenyang Transformer Group Co., Ltd., Xi'an Electric transformer limited liability any company, Baoding Tianwei Electric Co., Ltd., Shanghai Electric Power Company, TBEA Hengyang Transformer Co., Ltd., Beijing Huatai change Pressure Co., Ltd, and Power Electric Group Co., Ltd., Guangzhou Prosperous Electric Co., Ltd., Shandong Dachi Electric Co., Ltd.

1 Scope

GB 1094 This section provides power transformers in the overcurrent effect caused by an external short circuit should be no damage to the requirements. This section it describes the characterization of power transformers withstand such heat resistance over current calculation program and bear the corresponding test special ability and dynamic stability Theoretical Assessment Method (see Appendix A).

This section applies to GB 1094.1 Suo transformer within the scope of the provisions.

2 Normative references

The following documents contain provisions which, through reference in this Part of GB 1094 constitute provisions of this section. For dated references, all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encourage the agreement on this section Whether the parties can study the latest versions of these documents. For undated reference documents, the latest versions apply to this section.

GB 1094.1-1996 Power transformers - Part 1. General (eqv IEC 60076-1:1993) GB 1094.3-2003 Power transformers Part 3. Insulation levels, dielectric tests and external insulation air gap (IEC 60076-3.

2000, MOD)

GB 1094.11-2007 Power transformers Part 11. Dry-type transformers (IEC 60076-11:2004, MOD) GB/T 13499-2002 Application guide for power transformers (idt IEC 60076-8:1997)

3.1 General

Transformer and its components and accessories shall be designed and manufactured to withstand external short circuit under the conditions specified in this section 3.2 and the thermal efficiency of dynamic stability it should be no damage.

External short circuit includes a three-phase short circuit, phase short circuit, two phase to ground and ground fault. These fault currents induced in the windings in Part Points referred to as "over-current."

3.2.1.1 Require special consideration of conditions

Following cases overcurrent size, duration or frequency of occurrence of an impact, the need for special consideration and should be in the transformer technical specification Give clearly defined.

--- Regulating transformer impedance small, we need to consider the impedance of the current limiting device is connected;

- Generator transformers are vulnerable because the generator is connected with the loss of synchronization system produced higher overcurrent;
- Direct rotary motor (such as a motor or a synchronous phase modulation device) connected to the transformer under system fault conditions, the state of power generation was run the rotary transformer supplying current to the motor;
- Special transformers and transformer installed in a high failure rate of the system (see 3.2.6);
- Failure, higher than the rated operating voltage fault occurs on a non-terminal.

3.2.1.2 Current limit on boosting transformer

When combined impedance transformer and booster systems lead to short-circuit current value is so great that the design withstand this excess current transformer is difficult or without when the economic, manufacturing and users should consult together to determine the maximum allowable over current value. In this case, the user should take measures to limit the overcurrent to producing the determined and the flag over the maximum current value on the nameplate.

3.2.2 Having two separate windings

3.2.2.1

This section provides a three-phase or three-phase transformer rated capacity of the group is divided into three categories.

I class. 25kVA ~ 2500kVA;

II class. 2501kVA ~ 100000kVA;

III class. 100000kVA above.

3.2.2.2

Unless otherwise specified, symmetrical short-circuit current (rms value, see 4.1.2) shall be measured transformer short-circuit impedance coupled system Short-circuit impedance calculation.

For class I transformer, if the system short-circuit impedance is equal to or less than 5% of the transformer short-circuit impedance, the short-circuit current calculation system Short-circuit impedance should be negligible.

Peak short-circuit current 4.2.3 should be calculated.

3.2.2.3

Table 1 shows the minimum value of the transformer short-circuit impedance at rated current (primary tap) under, if you need a lower short-circuit impedance value when the