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

GB/T 15469.1-2008

Replacing GB/T 15469-1995

**Hydraulic turbines, storage pumps and pump-turbines
cavitation pitting evaluation -- Part 1: cavitation pitting
evaluation in reaction turbines**

水轮机、蓄能泵和水泵水轮机空蚀评定 第1部分：反击式水轮机的空蚀评定
(English Translation)

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Foreword

GB/T 15469 "turbines, storage pumps and pump - turbines cavitation assessment" is divided into the following three parts.

- Part 1. reaction turbines cavitation assessment;
- Part 2. storage pumps and pump - turbines cavitation assessment;
- Part 3. Pelton turbine cavitation assessment.

This section GB/T 15469 Part 1.

The partial modification of the International Electrotechnical Commission IEC 60609-1:2004 "turbines, storage pumps and pump - turbines cavitation pitting evaluation 1 Part reaction turbines assessment ", while the text, and graphics units were normalized.

The main difference between this part of IEC 60609-1 is described in Appendix B, respectively.

This Part replaces GB/T 15469-1995 "reaction turbine cavitation assessment." Some of the

major differences compared with the GB/T 15469-1995 This is.

--- Original reference standard running time of 8000h, modify this section for more run time per day plant operation 8000h or less time for the daily operation of the unit running 3000h;

--- Original standard on cavitation guaranteed value is calculated using the formula applied form part of the body in a way to modify this section by example Consider, as an appendix A, which cavitation guaranteed value calculation formula applied by way of the curve.

Appendix A of this section is normative appendix, Appendix B is an informative annex.

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

This part of the National Standardization Technical Committee turbine (SAC/TC175) centralized.

This part mainly drafted by. Dongfang Electrical Machinery Co., Ltd, China Institute of Water Resources and Hydropower, Harbin Electric Machinery Co., Ltd.

Introduction

This section provides cavitation evaluation in reaction turbines.

The degree of reaction turbines cavitation depends on the following five main factors.

- a) the type and design of the turbine;
- b) material and surface state of the site of action of cavitation;
- c) turbine installation elevation, or station cavitation coefficient (σ_P);
- d) duration of operation and operating conditions;
- e) water quality.

a), b) depending on the characteristics of the turbine itself. And c), d), e) depending on the operating conditions of the power plant. Thus, cavitation should be guaranteed for the two sides need to agree in power plant planning and design stage or contract. When the requirements for renewal or wheel has a wider operating range, the supplier in a bid to make recommendations to ensure that the amount of cavitation.

Cavitation can use the following two methods to ensure the consultation.

First, according to the contract in a given turbine installation height (corresponding to the power plant cavitation coefficient σ_P), and turbine size, speed, overcurrent Component material, surface condition and operating conditions and other consultations cavitation guaranteed value (see Figure 1a);

Second, under certain conditions cavitation permitted value, consult turbine installation elevation (see Figure 1b).

In most cases, the unit normal operation without cavitation conditions, or be required to operate without cavitation conditions, sometimes for economic Reasons, but also it allows a slight cavitation, namely turbine installation elevation above the elevation can run without cavitation.

Each station a) ~ e) items are different, the development of common acceptable cavitation allowable value is not appropriate. Therefore, it is recommended according to each Economic assessment of plant conditions. Installation is usually lower elevation (greater station cavitation coefficient σ_P values \u200b\u200brequire higher costs of civil engineering) and /or more expensive wheel (shape and/or materials) reduces the amount of cavitation. Higher cost benefits is to reduce operating costs and reduce maintenance frequency Rate, and can reduce downtime because of power loss.

Cavitation depth, size and function of the quality and the runner diameter, see Appendix A.

1 turbine as a function of flow rate in a certain amount of time and space station cavitation erosion coefficient

Figure 1 (cont.)

Turbines, storage pumps and pump - turbines cavitation pitting evaluation Part 1. reaction turbines cavitation assessment

2 Normative references

The following documents contain provisions which, through GB/T 15469 references become part of the present provisions of this section. For dated reference documents Member, all subsequent amendments (not including errata content) or revisions do not apply to this section, however, encouraged to reach under this section Parties to the research protocol to use the latest versions of these documents. For undated reference documents, the latest versions apply to this section.