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**GB/T 8117.3-2014**

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**Rules for steam turbine thermal acceptance test-Part 3:Method  
C-Thermal performance verification tests of retrofitted steam  
turbines**

汽轮机热力性能验收试验规程 第3部分：方法 C 改造汽轮机的热力性能验证试验  
**(English Translation)**

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## Foreword

GB/T 8117 "steam turbine thermal acceptance tests" is divided into three parts.

--- Part 1. Method A large condensing steam turbine with high accuracy test;

--- Part 2. Method B types and sizes of turbines Wide range of accuracy;

--- Part 3. Method C transformation turbine thermal performance verification tests.

This section GB/T 8117 Part 3.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This section uses the translation method is equivalent to using IEC 60953-3:2001 "steam turbine thermal acceptance tests - Part 3. Transformation of Steam Turbine Thermal performance verification test. " this part made the following editorial changes.

--- Consistent with the existing standard series, the standard name will be changed to "procedures turbine thermal acceptance tests - Part 3. Method C Thermal Performance transformation Turbine verification tests. " this part is proposed by the China Electrical Equipment Industrial Association.

This part of the National Standardization Technical Committee turbine (SAC/TC172) centralized.

This section is drafted. Shanghai Power Equipment Research Institute, Xi'an Thermal Power Research Institute Co., Ltd.

## Introduction

Transformation active steam turbines often include performance improvements. Part 1 and Part 2 provides a new steam turbine power plant Force performance acceptance testing procedures, but still can not meet all the requirements of specific renovation projects, and therefore the need for a supplementary test procedures, as Reconstruction turbine thermal acceptance test guidelines.

However, the first part and a lot of terms and recommended requirements of Part 2 still apply to test reconstruction project, therefore, in order to avoid content Repetition and excessive length, in this section appears only transform unit unique supplement and amendment.

This section should be read in conjunction with Part 2, and with the "verification test" instead of "acceptance tests", and Part 2 as a reference standard to make use. Structure and terms of the number of the section in line with Section 2, sub-clause in this section instead of part 2 of all the corresponding sub-clause.

As long as there is this part of what is new, increased sub-clause number, the number sequentially extended, Part 2 without amendment of sub-clause is not in this section Repeat.

Since Part 2 is more common and more suitable for renovation projects, so the use of Part 2 of this section as a reference standard, rather than Part 1 Minute. Although this section applies to the transformation of large condensing steam turbine, but can also be applied to other types and sizes of turbines, as relevant it was agreed that the basis of specific test schedules.

Part 2 takes precedence over Part 1 as a reference standard does not mean reduced accuracy, but for renovation projects and related guaranteed , The former provisions can get suitable test accuracy. In some cases, the need to use Part 1 of more stringent rules in order to achieve the aim of these projects shall be specified in the present section.

Given the provisions of this section apply to the transformation of turbine equipment for all hardware components. But for other devices (such as boilers, water heating Etc.) transformation test is not included in this section, even though these changes may affect the performance of the thermodynamic cycle.

The purpose of this section is to verify the impact of the transformation of plant efficiency turbine performance guarantee value. Many different revamping encounter, such as replacement of the steam valve, part of the turbine blades, rotor, replacement of the whole module. Ensure that the value will depend on the specific circumstances of the transformation to and the parties to the contract agreed upon protocol. According to this section, the parties can determine the most appropriate parameter values \u200b\u200bas a guarantee in order to evaluate the performance after the transformation.

The main difficulty is the choice of the transformation project guaranteed values. Although the original manufacturer are usually willing to adopt improved relative performance guarantee value, but for Do not need to understand the transformation of the original equipment supplier for all other details in terms of absolute performance may be willing to use the device after transformation guaranteed. This section Given the choice of guaranteed guidance. Once the guaranteed value, you may need to test performance by the transformation of the former recalculate the guaranteed value. this these provisions also provide a partial guarantee for value verification.

This appendix section gives several detailed application examples, this section is difficult to fully cover all situations transformation project.

Part and Part 2 of the main differences in the main terms are as follows.

--- Scope and purpose this part in particular made some new guarantee value is defined. So that it may transform a typical indicator device (such as cylinder efficiency, the valve chamber Chamber pressure drop, etc.) that guarantee. Absolute guarantee that the value specified in Section 2 is not suitable for determining the transformation between the rear original equipment and devices Improved results, so this part of the introduction of relatively guaranteed.

Because there are a variety of different transformation case, a contractual warranty terms vary, so this part of the requirements of the terms of the contract review. in when determining the guaranteed value, that is written in the contract stage before the performance verification tests will depend on the terms of the contract agreement the parties agreed.

--- Units, symbols, terms and definitions all units, symbols, terms and definitions applicable to Part 2 of this section. However, the present situation and the transformation section contains relevant new Concepts and new terminology, especially the proposed new definition of the second supplement or replace the guaranteed portion. This section has a guide table for each relevant Elects to adapt the project to ensure value.

Guaranteed manufacturers can provide are.

- ensure absolute value

--- Heat efficiency or heat consumption rate of the steam turbine;

Steam flow --- a predetermined condition, thermodynamic efficiency of the steam turbine or steam consumption rate or output power;

--- Main steam flow capacity and/or the maximum power output;

--- Internal efficiency of the turbine of each cylinder.

- ensure relative value

- Steam turbine thermal efficiency or improved heat rate;
- Thermodynamic efficiency or steam consumption rate or improved output power;
- Main steam flow capacity and/or improved maximum output power;
- Steam Turbine cylinder efficiency improvements.
- General

General Part 2 is also most useful in retrofit situations. Amended or supplemented in this chapter include. Note when the transformation of the former, after the test Precautions, as well as when making performance improvements to ensure that the required reference value.

Pay special attention to the system to isolate the problem and can cause tolerance measurements a significant impact on the test results.

--- Measurement technology and instrumentation in the renovation project, we can not set firm guidelines on measurement techniques and instrumentation. Select the instrument should be able to meet the desired installation and inspection it requires permits guaranteed values. Appendix J gives the accuracy of individual measurements to ensure that the value of sensitivity coefficient, able to make the most appropriate instrument s Choice.

As traffic is one of the most important measurement, so this part of the need to respect the installation of flow measurement devices gives guidance. Push Recommended allows simultaneous measurement and comparison of the main flow method. The situation is difficult to remove the flow meter for routine check, using a diagram given in Appendix K Track measuring flow as a suitable alternative.

--- Test Calculation this section gives the rules applicable to the calculation of guaranteed value of the renovation project. For retrofit applications of unknown leak, also gives special Provisions.

--- Amendments and compare test results with guaranteed values Correction method specified in Section 2 also apply to this section, but there is no guarantee for new types of value of special provisions. For deferred Test, gives guidance on aging issues.

This chapter also includes the effectiveness of the performance values, these values \u200b\u200bare used to determine the reference base to ensure performance improvement value. When the transformation of the former test table Ming will be the transformation of the actual state of the predetermined condition of the turbine are different, more acceptable to the original guaranteed value to be modified.

Reconstruction turbine or its components may affect other devices (feedwater heaters, condensers, boilers) operating conditions. If the transformation Movies it rang beyond the boundary conditions, may be required to the manufacturer's instructions on the