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Gas turbine combined cycle power plants — Thermal performance tests

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 192, *Gas turbines*.

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Introduction

This document specifies standard rules for preparing, conducting, evaluating and reporting thermal performance tests in order to determine and/or verify the power output, the thermal efficiency (heat rate) and/or other performance test parameters for gas turbine driven combined cycle power plants. It provides information on methods of measurement considering uncertainties and on methods for corrected results obtained under test conditions in order to compare to guaranteed or specified conditions.

The objective of testing conducted per this document is to determine combined cycle thermal performance characteristics in accordance with any previously drawn up agreements such as the purchase agreements, test criteria documents, engineering, procurement and construction (EPC) requirements, power purchase agreements, power and water purchase agreements, contractual services agreements.

The document also provides guidelines for comparative tests designed to check performance differentials of the combined cycle and cogeneration power plants, for testing before and after modifications, upgrades or overhauls. Improvements to achieve additional performance of the combined cycle may include modification/substitutions of main components and additions of components inside test boundary. This comparative testing philosophy may also be used for “periodic testing” of the plant in order to monitor overall plant performance degradation, while giving due consideration to the relative testing uncertainty.

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INTERNATIONAL STANDARD **ISO 18888:2017(E)**

Gas turbine combined cycle power plants — Thermal performance tests

1 Scope

This document specifies standard rules for preparing, conducting, evaluating and reporting thermal performance tests on combined cycle and cogeneration power plants driven by gas turbines for base and part load operation with or without supplementary firing.

This document is applicable to

— thermal performance tests for general information,

— thermal acceptance tests for determining the performance of the combined cycle plant in relation to a contractual guarantee, and

— comparative tests designed to check the performance differentials of the combined cycle and cogeneration power plants, for testing before and after modifications, upgrades or overhauls.

It can be used to determine the following thermal performance test goals and expected values, under specific operating and reference conditions within defined test boundaries:

— electrical power output;

— heat rate or thermal efficiency;

— process steam and/or district heat w/o generation of electrical power output by means of a steam turbine.

This document does not apply to individual equipment component testing, which is covered by corresponding standards.

It is not intended to be applied to the following test goals:

— environmental testing for example emissions, noise;

— vibration testing;

— operational testing;

— absolute or comparative performance of specific components of the combined cycle covered by dedicated standards (e.g. gas turbines).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2314:2009, *Gas turbines — Acceptance tests*

ISO 3675, *Crude petroleum and liquid petroleum products — Laboratory determination of density — Hydrometer method*

ISO 5167 (all parts), *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running in full*

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