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Procedures for Routine Performance Tests of Steam Turbines

PERFORMANCE
TEST
CODES
REPORT

A Report by
Performance Test Code Committee No. 6
on Steam Turbines

THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
United Engineering Center
345 East 47th Street New York, N.Y. 10017

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Procedures for Routine Performance Tests of Steam Turbines

(Not Intended for Acceptance Testing)

ASME PTC 6S Report-1988

[REVISION OF ASME PTC 6S REPORT-1970 (R1985)]

PERFORMANCE TEST CODES

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Date of Issuance: December 15, 1989

This document will be revised when the Society approves the issuance of the next edition, scheduled for 1992. There will be no Addenda issued to PTC 6S Report-1988.

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FOREWORD

(This Foreword is not part of ASME PTC 6S Report-1988.)

Users of both large and small turbines have experienced an increasing need for procedures for routine turbine tests which trend performance with time. The use of full-scale ASME Performance Test Code procedures and instrumentation for this purpose is expensive and produces information and accuracy beyond that necessary for periodic monitoring. When ASME Performance Test Code Committee No. 6 was reorganized to revise PTC 6-1949, it was charged also with developing simplified procedures for periodic tests. Because of the routine nature of the tests, these procedures were to emphasize repeatability of results rather than absolute accuracy and thus provide a more economic means of monitoring performance trends.

This Report reflects the consensus of knowledgeable engineers and contains recommended procedures for collecting sufficiently accurate data to permit analyses of performance trends. Recommendations are given which include advance planning, cycle isolation, and suggested presentation of results. Emphasis is placed upon the use of accurate instrumentation, approaching measurement uncertainties required by the Code, for the measurement of critical variables that are part of the heat-rate equation. Other instrumentation is specified to produce results of good accuracy and of a high degree of repeatability. With the application of automatic data-logging and on-line computer systems to the plant cycle, the procedures presented in this Report, when applied to this end, should satisfy the needs of users of both large and small turbines.

Procedures recommended in this Report are not intended to produce abolute levels of performance. If absolute performance level is required, the ASME Test Code for Steam Turbines, PTC 6, 1976, reaffirmed 1985, or the Interim Test Code for an Alternative Procedure for Testing Steam Turbines, PTC 6.1, 1984, should be followed. For other levels of accuracy, where the test instrumentation varies from the Test Code specified procedure, the Report by PTC Committee No. 6 on "Guidance for Evaluation of Measurement Uncertainty in Performance Tests of Steam Turbines," 1985 should be consulted.

Users of this Report are requested to comment and provide to the Committee supporting data obtained with these procedures. Such comment and repeatability data covering long-term and/or extensive experience will provide guidance for subsequent revisions of this Report. User suggestions and data should be submitted to the Secretary, ASME Performance Test Codes Committee, 345 East 47th Street, New York, New York 10017.

This Report was approved by the ASME Board on Performance Test Codes and adopted as a standard practice of the Society on May 8, 1988. It was approved as an American National Standard by the ANSI Board of Standards Review on September 8, 1988.

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