INTERNATIONAL STANDARD

ISO 3977-3

First edition
2002-07-01

Gas turbines — Procurement —

Part 3: Design requirements

Turbines à gaz — Spécifications pour l'acquisition —

Partie 3: Exigences de conception

Reference number
ISO 3977-3:2002(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

Contents

Page

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO 3977 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 3977-3 was prepared by Technical Committee ISO/TC 192, *Gas turbines*.

ISO 3977 consists of the following parts, under the general title *Gas turbines — Procurement*:

— *Part 1: General introduction and definitions*

— *Part 2: Standard reference conditions and ratings*

— *Part 3: Design requirements*

— *Part 4: Fuels and environment*

— *Part 5: Applications for petroleum and natural gas industries*

— *Part 7: Technical information*

— *Part 8: Inspection, testing, installation and commissioning*

— *Part 9: Reliability, availability, maintainability and safety*

Annexes A and B of this part of ISO 3977 are for information only.

Gas turbines — Procurement —

Part 3: Design requirements

1 Scope

This part of ISO 3977 covers the design requirements for the procurement of all applications of gas turbines and gas turbine systems, including gas turbines for combined cycle systems and their auxiliaries, by a purchaser from a packager. It also provides assistance and technical information to be used in the procurement.

It is not intended to deal with local or national legislative requirements with which the installation may be required to conform.

This part of ISO 3977 is applicable to simple-cycle, combined-cycle and regenerative-cycle gas turbines working in open systems. It is not applicable to gas turbines used to propel aircraft, road construction and earth moving machines, agricultural and industrial types of tractors and road vehicles.

In cases of gas turbines using special heat sources (for example, chemical process, nuclear reactors, furnace for a super-charged boiler), this part of ISO 3977 provides a basis.

The relevant parts of ISO 3977 are applicable to closed and semi-closed systems.

NOTE Additional requirements for special gas turbine applications are described in ISO 3977-5.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 3977. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 3977 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

NOTE In cases where there are no International Standards available, national standards as shown in annex B may be used as guidelines with the mutual agreement of the purchaser and packager.

ISO 1940-1:1986, *Mechanical vibration — Balance quality requirements of rigid rotors — Part 1: Determination of permissible residual unbalance*

ISO 3448, *Industrial liquid lubricants — ISO viscosity classification*

ISO 3977-1:1997, *Gas turbines — Procurement — Part 1: General introduction and definitions*

ISO 3977-2:1997, *Gas turbines — Procurement — Part 2: Standard reference conditions and ratings*

ISO 3977-4:2002, *Gas turbines — Procurement — Part 4: Fuels and environment*

ISO 3977-7:2002, *Gas turbines — Procurement — Part 7: Technical information*

ISO 3977-8:2002, *Gas turbines — Procurement — Part 8: Inspection, testing, installation and commissioning*

ISO 3977-9:1999, *Gas turbines — Procurement — Part 9: Reliability, availability, maintainability and safety*

ISO 7919-1:1996, *Mechanical vibration of non-reciprocating machines — Measurements on rotating shafts and evaluation criteria — Part 1: General guidelines*

ISO 7919-2:2001, *Mechanical vibration — Evaluation of machine vibration by measurements on rotating shafts — Part 2: Land-based steam turbines and generators in excess of 50 MW with normal operating speeds of 1 500 r/min, 1 800 r/min, 3 000 r/min and 3 600 r/min*

ISO 7919-4:1996, *Mechanical vibration of non-reciprocating machines — Measurements on rotating shafts and evaluation criteria — Part 4: Gas turbine sets*

ISO 10436:1993, *Petroleum and natural gas industries — General-purpose steam turbines for refinery service*

ISO 10441:1999, *Petroleum and natural gas industries — Flexible couplings for mechanical power transmission — Special purpose applications*

ISO 10442:—[1)], *Petroleum, chemical and gas service industries — Packaged, integrally geared centrifugal air compressors for general refinery services*

ISO 10494:1993, *Gas turbines and gas turbine sets — Measurement of emitted airborne noise — Engineering/survey method*

ISO 10814:1996, *Mechanical vibration — Susceptibility and sensitivity of machines to unbalance*

ISO 10816-1:1995, *Mechanical vibration — Evaluation of machine vibration by measurements of non-rotating parts — Part 1: General guidelines*

ISO 10816-2:1996, *Mechanical vibration — Evaluation of machine vibration by measurements of non-rotating parts — Part 2: Large land-based steam turbine generator sets in excess of 50 MW*

ISO 10816-4:1998, *Mechanical vibration — Evaluation of machine vibration by measurements of non-rotating parts — Part 4: Gas turbine driven sets excluding aircraft derivatives*

ISO 11086:1996, *Gas turbines — Vocabulary*

ISO 11042-1:1996, *Gas turbines — Exhaust gas emission — Part 1: Measurement and evaluation*

ISO 11042-2:1996, *Gas turbines — Exhaust gas emission — Part 2: Automated emission monitoring*

ISO 13691:2001, *Petroleum and natural gas industries — High-speed special-purpose gear units*

ISO 13709:—[1)], *Centrifugal pumps for petroleum, petrochemical, and natural gas industries*

IEC 60034-1, *Rotating elecrical machines — Part 1: Rating and performance*

IEC 60079 (all parts), *Electrical apparatus for explosive gas atmospheres*

ANSI B 31.3, *Chemical plant and petroleum refinery piping*

ASME *Boiler and Pressure Vessel Code Section IX*

ASTM A-194, *Carbon and alloy steel nuts for bolts for high-pressure and high-temperature service*

ASTM A-307, *Carbon steel externally threaded standard fasteners*

NACE MR-0175, *Sulfide Stress Cracking Resistant Metallic Materials for Oilfield Equipment*

1) To be published.