

# **SLOVENSKI STANDARD**

## **SIST EN IEC 60953-3:2022**

**01-november-2022**

**Nadomešča:**  
**SIST EN 60953-3:2002**

---

**Pravila za preskuse toplotne sprejemljivosti parne turbine - 3. del: Preskusi preverjanja toplotne učinkovitosti naknadno vgrajenih parnih turbin (IEC 60953-3:2022)**

Rules for steam turbine thermal acceptance tests - Part 3: Thermal performance verification tests of retrofitted steam turbines (IEC 60953-3:2022)

Regeln für thermische Abnahmeprüfungen für Dampfturbinen - Teil 3: Thermische Leistungsangabenüberprüfung für modernisierte Dampfturbinen (IEC 60953-3:2022)

Règles pour les essais thermiques de réception des turbines à vapeur - Partie 3: Essais de vérification des performances thermiques des turbines à vapeur rénovées (IEC 60953-3:2022)

**Ta slovenski standard je istoveten z: EN IEC 60953-3:2022**

---

**ICS:**

27.040

Plinske in parne turbine.  
Parni stroji

Gas and steam turbines.  
Steam engines

**SIST EN IEC 60953-3:2022**

**en**



EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN IEC 60953-3**

September 2022

ICS 27.040

Supersedes EN 60953-3:2002

English Version

**Rules for steam turbine thermal acceptance tests - Part 3:  
Thermal performance verification tests of retrofitted steam  
turbines  
(IEC 60953-3:2022)**

Règles pour les essais thermiques de réception des  
turbines à vapeur - Partie 3: Essais de vérification des  
performances thermiques des turbines à vapeur rénovées  
(IEC 60953-3:2022)

Regeln für thermische Abnahmeprüfungen für  
Dampfturbinen - Teil 3: Thermische  
Leistungsangabenüberprüfung für modernisierte  
Dampfturbinen  
(IEC 60953-3:2022)

This European Standard was approved by CENELEC on 2022-08-24. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

<https://standards.iteh.ai/catalog/standards/sist/c268e4ce-2fa7-41ea-92dc-3e91a675aac3/sist-60953-3-2022>  
CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.



European Committee for Electrotechnical Standardization  
Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN IEC 60953-3:2022 (E)****European foreword**

The text of document 5/249/FDIS, future edition 2 of IEC 60953-3, prepared by IEC/TC 5 "Steam turbines" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60953-3:2022.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2023-05-24 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2025-08-24 document have to be withdrawn

This document supersedes EN 60953-3:2002 and all of its amendments and corrigenda (if any).

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

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

**Endorsement notice**  
(standards.iteh.ai)

The text of the International Standard IEC 60953-3:2022 was approved by CENELEC as a European Standard without any modification. [SIST EN IEC 60953-3:2022](https://standards.iteh.ai/catalog/standards/sist/c268e4ce-2fa7-41ea-92dc-3e91a675aac3/sist-en-iec-60953-3-2022)

<https://standards.iteh.ai/catalog/standards/sist/c268e4ce-2fa7-41ea-92dc-3e91a675aac3/sist-en-iec-60953-3-2022>

## Annex ZA (normative)

### Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: [www.cenelec.eu](http://www.cenelec.eu).

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60953-0	-	Rules for steam turbine thermal acceptance tests - Part 0: Wide range of accuracy for various types and sizes of turbines	EN IEC 60953-0	-

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

SIST EN IEC 60953-3:2022

<https://standards.iteh.ai/catalog/standards/sist/c268e4ce-2fa7-41ea-92dc-3e91a675aac3/sist-en-iec-60953-3-2022>





IEC 60953-3

Edition 2.0 2022-07

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Rules for steam turbine thermal acceptance tests –  
Part 3: Thermal performance verification tests of retrofitted steam turbines**

**Règles pour les essais thermiques de réception des turbines à vapeur –  
Partie 3: Essais de vérification des performances thermiques des turbines à  
vapeur rénovées**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

COMMISSION  
ELECTROTECHNIQUE  
INTERNATIONALE

ICS 27.040

ISBN 978-2-8322-3974-2

**Warning! Make sure that you obtained this publication from an authorized distributor.  
Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.**

## CONTENTS

FOREWORD.....	8
INTRODUCTION.....	10
1 Scope.....	13
1.1 General.....	13
1.2 Object.....	13
1.3 Matters to be considered in the contract .....	13
2 Normative references .....	13
3 Units, symbols, terms and definitions.....	14
3.1 General.....	14
3.2 Symbols, units .....	14
3.3 Subscripts, superscripts and definitions .....	14
3.4 Guarantee parameters .....	16
3.4.1 Guidance on guarantee parameters .....	16
3.4.2 Thermal efficiency .....	16
3.4.3 Heat rate .....	16
3.4.4 Thermodynamic efficiency .....	16
3.4.5 Steam rate.....	16
3.4.6 Main steam flow capacity.....	16
3.4.7 Power output .....	16
3.4.8 Guarantee values for extraction and mixed-pressure turbines.....	16
3.4.9 Thermal Load Capacity (for Nuclear applications).....	16
3.5 Additional guarantee parameters .....	16
3.5.1 General .....	16
3.5.2 Cylinder isentropic efficiency – expansion in superheated region.....	16
3.5.3 Cylinder isentropic efficiency – expansion involving wet region.....	17
3.5.4 Pressure loss.....	19
3.5.5 Flow-passing capacity (FPC) .....	19
4 Guiding principles.....	19
4.1 Advance planning for test.....	19
4.2 Preparatory agreements and arrangements for tests .....	20
4.3 Planning of the test.....	20
4.3.1 Time for verification tests.....	20
4.3.2 Direction of acceptance tests.....	21
4.4 Preparation of the tests.....	21
4.4.1 Condition of the plant.....	21
4.4.2 Condition of the steam turbine .....	22
4.4.3 Condition of the condenser .....	22
4.4.4 Isolation of the cycle.....	22
4.4.5 Checks for leakage of condenser and feed water heaters .....	22
4.4.6 Cleanliness of the steam strainers .....	22
4.4.7 Checking of the test measuring equipment .....	22
4.5 Comparison measurements.....	22
4.6 Settings for test .....	23
4.6.1 Load settings.....	23
4.6.2 Special settings .....	23
4.7 Preliminary tests .....	23
4.8 Acceptance tests .....	23



4.8.1	Constancy of test conditions .....	23
4.8.2	Maximum deviation and fluctuation in test conditions .....	23
4.8.3	Duration of test runs and frequency of reading .....	23
4.8.4	Reading of integrating measuring instruments .....	23
4.8.5	Alternative methods .....	23
4.8.6	Recording of tests .....	23
4.8.7	Additional measurement .....	23
4.8.8	Preliminary calculations .....	23
4.8.9	Consistency and number of tests .....	24
4.9	Repetition of acceptance tests .....	24
4.10	Guidance on retrofit guarantees .....	24
4.10.1	General .....	24
4.10.2	Absolute guarantees .....	25
4.10.3	Relative guarantees .....	26
5	Measuring techniques and measuring instruments .....	27
5.1	Overview .....	27
5.1.1	Instrument accuracy requirements .....	27
5.1.2	Measuring instruments .....	27
5.1.3	Measuring uncertainty .....	27
5.1.4	Calibration of instruments .....	27
5.1.5	Alternative instrumentation .....	27
5.1.6	Consistency of pre- and post-retrofit tests .....	27
5.2	Measurement of power .....	27
5.2.1	Determination of mechanical turbine output .....	27
5.2.2	Measurement of boiler feed pump power .....	27
5.2.3	Determination of electrical power of a turbine generator .....	28
5.2.4	Measurement of electrical power .....	28
5.2.5	Electrical instrument connections .....	28
5.2.6	Electrical instruments .....	28
5.2.7	Instrument transformers .....	28
5.2.8	Determination of electrical power of pre- and post-retrofit tests .....	28
5.3	Flow measurement .....	28
5.3.1	Determination of flows to be measured .....	28
5.3.2	Measurement of primary flow .....	29
5.3.3	Installation and location of flow measuring devices .....	29
5.3.4	Calibration of primary flow devices for water flow .....	29
5.3.5	Inspection of flow measuring devices .....	29
5.3.6	Differential pressure measurements .....	30
5.3.7	Water flow fluctuation .....	30
5.3.8	Secondary flow measurements .....	30
5.3.9	Occasional secondary flows .....	31
5.3.10	Density of water and steam .....	31
5.3.11	Determination of cooling water flow of condenser .....	31
5.4	Pressure measurement (excluding condensing turbine exhaust pressure) .....	31
5.4.1	Pressures to be measured .....	31
5.4.2	Instruments .....	31
5.4.3	Main pressure measurements .....	31
5.4.4	Pressure tapping holes and connecting lines .....	31
5.4.5	Shut-off valves .....	32

5.4.6	Calibration of pressure measuring devices.....	32
5.4.7	Atmospheric pressure .....	32
5.4.8	Correction of readings .....	32
5.5	Condensing turbine exhaust pressure measurement .....	32
5.5.1	General .....	32
5.5.2	Plane of measurement.....	32
5.5.3	Pressure taps .....	32
5.5.4	Manifolds.....	32
5.5.5	Connecting lines.....	32
5.5.6	Instruments .....	32
5.5.7	Calibration .....	32
5.6	Temperature measurement .....	33
5.6.1	Points of temperature measurement .....	33
5.6.2	Instruments .....	33
5.6.3	Main temperature measurements.....	33
5.6.4	Feed train temperature measurements (including bled steam) .....	33
5.6.5	Condenser cooling water temperature measurement .....	33
5.6.6	Thermometer wells .....	33
5.6.7	Precautions to be observed in the measurement of temperature .....	33
5.7	Steam quality determination.....	33
5.7.1	General .....	33
5.7.2	Tracer technique.....	33
5.7.3	Condensing method.....	33
5.7.4	Constant rate injection method .....	33
5.7.5	Extraction enthalpy determined by constant rate injection method .....	33
5.7.6	Tracers and their use.....	34
5.7.7	Use of tracer techniques in retrofit applications .....	34
5.8	Time measurement .....	34
5.9	Speed measurement .....	34
6	Evaluation of tests .....	34
6.1	Preparation of evaluation .....	34
6.2	Computation of results .....	35
6.2.1	Calculation of average values of instrument readings .....	35
6.2.2	Correction and conversion of averaged readings .....	35
6.2.3	Checking of measured data .....	35
6.2.4	Thermodynamic properties of steam and water.....	36
6.2.5	Calculation of test results .....	36
7	Corrections of test results and comparison with guarantee .....	39
7.1	Guarantee values and guarantee conditions .....	39
7.1.1	Guarantee values and guarantee conditions specific to retrofits.....	39
7.2	Correction of initial steam flow capacity .....	40
7.3	Correction of output .....	40
7.3.1	Correction of maximum output.....	40
7.3.2	Correction of Output with specified initial steam flow .....	40
7.4	Correction of the thermal performance .....	40
7.5	Definition and application of correction values .....	40
7.6	Correction methods.....	40
7.6.1	General .....	40
7.6.2	Correction by heat balance calculation .....	40

7.6.3	Correction by use of correction curves prepared by the manufacturer .....	41
7.6.4	Tests to determine correction values .....	41
7.7	Variables to be considered in the correction of specific turbine cycles .....	41
7.7.1	Scope of corrections .....	41
7.7.2	Turbines with regenerative feed-water heating .....	41
7.7.3	Turbines which have no provision for the addition or extraction of steam after partial expansion .....	41
7.7.4	Turbines with steam extraction for purposes other than feed-water heating (extraction turbines) .....	41
7.7.5	Other types of turbine .....	41
7.8	Guarantee comparison .....	41
7.8.1	Tolerance and weighting .....	41
7.8.2	Guarantee comparison with locus curve .....	41
7.8.3	Guarantee comparison with guarantee point .....	41
7.8.4	Guarantee comparison for turbines with throttle governing .....	41
7.8.5	Guarantee comparison for extraction turbines .....	41
7.8.6	Additional consideration for retrofit guarantee comparison .....	42
7.9	Deterioration of turbine performance (ageing) .....	42
7.9.1	Timing to minimise deterioration .....	42
7.9.2	Correction with comparison tests .....	42
7.9.3	Correction without comparison tests .....	42
7.9.4	Deterioration of performance of retrofitted components .....	42
8	Measuring uncertainty .....	43
8.1	General .....	43
8.2	Determination of measuring uncertainty of steam and water properties .....	43
8.2.1	Pressure .....	43
8.2.2	Temperature .....	43
8.2.3	Enthalpy and enthalpy difference .....	43
8.3	Calculation of measuring uncertainty of output .....	43
8.3.1	Electrical measurement .....	43
8.3.2	Mechanical measurement .....	43
8.3.3	Additional uncertainty allowance because of unsteady load conditions .....	43
8.4	Determination of measuring uncertainty of mass flow .....	44
8.4.1	Measuring uncertainty of mass flow measurements .....	44
8.4.2	Measuring uncertainty of multiple measurements of primary flow .....	44
8.4.3	Uncertainty allowance for cycle imperfections .....	44
8.5	Calculation of measuring uncertainty of results .....	44
8.5.1	General .....	44
8.5.2	Measuring uncertainty of thermal efficiency .....	44
8.5.3	Measuring uncertainty of thermodynamic efficiency .....	44
8.5.4	Uncertainty of corrections .....	44
8.5.5	Guiding values for the measuring uncertainty of results .....	44
8.6	Example uncertainty calculation .....	44
Annex A (normative)	Feedwater heater leakage and condenser leakage tests .....	45
A.1	Feedwater heater leakage tests .....	45
A.2	Condenser leakage tests .....	45
Annex B (normative)	Evaluation of multiple measurements, compatibility .....	46
Annex C (normative)	Mass flow balances .....	47
C.1	General .....	47

C.2	Flows for further evaluations (informative)	47
Annex D (informative)	Short-statistical definition of measuring uncertainty and error propagation in acceptance test	48
Annex E (informative)	Temperature variation method	49
E.1	Description of the problem	49
E.2	Possibility to determine the leakage flow	49
E.3	Applied example	49
Annex F (normative)	Measuring uncertainty of results – retrofit application	50
Annex G (informative)	Retrofit improvement calculation – numerical examples (fossil and nuclear)	53
G.1	General	53
G.2	Example of retrofitting a fossil-fired reheat turbine	53
G.2.1	General	53
G.2.2	HP cylinder retrofitting	57
G.2.3	LP cylinder retrofitting with relative guarantee on heat rate (treated separately from the HP case)	58
G.2.4	Effect of retrofit on associated plant performance	59
G.3	Example of retrofitting a nuclear turbine	65
G.3.1	General	65
G.3.2	Retrofit scenario and testing procedure	66
G.3.3	Correction curves	66
G.3.4	Application of correction curves	67
G.3.5	Comparison of the measured values to the guarantees	69
Annex H (informative)	Uncertainty calculation – numerical examples (fossil and nuclear)	78
H.1	General	78
H.2	Fossil case study	78
H.2.1	General	78
H.2.2	Evaluation	79
H.3	Nuclear case study	90
H.3.1	General	90
H.3.2	Evaluation	90
Figure 1	Isentropic efficiency of the HP cylinder	17
Figure 2	LP turbine expansion line	18
Figure G.1	HP cylinder expansion	54
Figure G.2	LP cylinder expansion	55
Figure G.3	Original heat balance diagram (or base line)	60
Figure G.4	Correction curves	61
Figure G.5	Pre-retrofit test	62
Figure G.6	Pre-retrofit test: HP cylinder replaced	63
Figure G.7	Pre-retrofit test: LP cylinder replaced	64
Figure G.8	Leaving loss curve	65
Figure G.9	Correction curve of heat rate due to live steam pressure	70
Figure G.10	Correction curve of heat rate due to thermal power	71
Figure G.11	Correction curve of heat rate due to exhaust pressure	71
Figure G.12	Correction curve of heat rate due to quality of live steam	72

Figure G.13 – Correction curve of heat rate for $\Delta p$ of the moisture separator/reheaters .....	72
Figure G.14 – Correction curve of heat rate due to temperature of the reheat steam .....	73
Figure G.15 – Correction curve of heat rate due to quality of steam after the moisture separator .....	73
Figure G.16 – Curve of live steam pressure before the valves of the turbine as a function of thermal power .....	74
Figure G.17 – Baseline heat balance .....	75
Figure G.18 – Guarantee heat balance .....	76
Figure G.19 – Post-retrofit test re-calculated heat balance .....	77
Figure H.1 – Instrumentation for a fossil plant .....	81
Figure H.2 – Instrumentation for a nuclear plant .....	92
Table 1 – Maximum deviations and fluctuations in operating conditions from specified and relative data .....	21
Table 2 – Guarantee alternatives .....	25
Table 3 – Apportionment of unaccounted leakages .....	36
Table 4 – Typical effects of cylinder efficiency on heat rate .....	43
Table G.1 – Main parameters of the heat balances (Figure G.17 to Figure G.19) .....	68
Table G.2 – Comparison between guaranteed and post-test re-calculated heat balance .....	68
Table G.3 – Measured and corresponding calculated values from the post-test .....	69
Table G.4 – Corrections due to differences between measured and calculated values (from post re-calculated heat balance, Figure G.19) .....	69
Table G.5 – Summary of corrections .....	70
Table H.1 – Assumed total measured variable uncertainty for pressure, temperature and generator output .....	78
Table H.2 – Uncertainty percentage of calculated results at different flow measurement uncertainty levels for a fossil plant .....	80
Table H.3 – Uncertainty percentage of calculated results at different correlation levels for a fossil plant .....	80
Table H.4 – Heat Rate uncertainty of a fossil plant .....	82
Table H.5 – HP isentropic efficiency uncertainty of a fossil plant .....	84
Table H.6 – IP isentropic efficiency uncertainty of a fossil plant .....	86
Table H.7 – LP isentropic efficiency uncertainty of a fossil plant .....	88
Table H.8 – Uncertainty percentage of calculated results at different flow measurement uncertainty levels for a nuclear plant .....	91
Table H.9 – Uncertainty percentage of calculated results at different correlation levels for a nuclear plant .....	91
Table H.10 – Heat Rate uncertainty of a nuclear plant .....	93
Table H.11 – HP isentropic efficiency uncertainty of a nuclear plant .....	95
Table H.12 – LP isentropic efficiency uncertainty of a nuclear plant .....	97

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**RULES FOR STEAM TURBINE THERMAL ACCEPTANCE TESTS –****Part 3: Thermal performance verification tests  
of retrofitted steam turbines****FOREWORD**

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

IEC 60953-3 has been prepared by subcommittee WG11/MT14: Thermal Acceptance Test, of IEC technical committee 5: Steam turbines. It is an International Standard.

This second edition cancels and replaces the first edition published in 2001. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) The Reference Standard has changed from IEC 60953-2 to IEC 60953-0 and therefore all changes made in IEC 60953-0 are relevant to this revised Supplementary Standard;
- b) Further detailed guidance is given for guarantee types in Clause 4.10;
- c) Annex H – Measuring uncertainty of results has been revised to more closely align with the ISO/IEC Guide 98: Uncertainty of measurement;
- d) Annex K – Tracer technique has been deleted;
- e) Annex L – Temperature variation method has been moved to IEC 60953-0.

The text of this International Standard is based on the following documents:

Draft	Report on voting
5/249/FDIS	5/252/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This part of IEC 60953 is to be read in conjunction with IEC 60953-0, and the words 'verification test' are to be read in place of 'acceptance test'. IEC 60953-0 is taken as a Reference Standard.

A list of all parts in the IEC 60953 series, published under the general title *Rules for steam turbine thermal acceptance tests*, can be found on the IEC website.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/standardsdev/publications](http://www.iec.ch/standardsdev/publications).

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under [webstore.iec.ch](http://webstore.iec.ch) in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.