



ICAO

International Standards
and Recommended Practices

Annex 6 to the Convention on International Civil Aviation

Operation of Aircraft

Part I — International Commercial Air Transport — Aeroplanes
Twelfth Edition, July 2022



This edition supersedes, on 3 November 2022, all previous editions of Part I of Annex 6.

For information regarding the applicability of the Standards and Recommended Practices, see the Foreword.

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AMENDMENTS

Amendments are announced in the supplements to the *Products and Services Catalogue*; the Catalogue and its supplements are available on the ICAO website at www.icao.int. The space below is provided to keep a record of such amendments.

RECORD OF AMENDMENTS AND CORRIGENDA

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ABBREVIATIONS AND SYMBOLS

(used in this Annex)

Abbreviations

AC	Alternating current
ACAS	Airborne collision avoidance system
ADRS	Aircraft data recording system
ADS	Automatic dependent surveillance
ADS-C	Automatic dependent surveillance — contract
AEO	All engines operative
AFCS	Automatic flight control system
AGA	Aerodromes, air routes and ground aids
AIG	Accident investigation and prevention
AIR	Airborne image recorder
AIRS	Airborne image recording system
AOC	Air operator certificate
APCH	Approach
APU	Auxiliary power unit
AR	Authorization required
ARINC	Aeronautical Radio, Incorporated
ASDA	Accelerate stop distance available
ASE	Altimetry system error
ASIA/PAC	Asia/Pacific
ATC	Air traffic control
ATM	Air traffic management
ATN	Aeronautical telecommunication network
ATS	Air traffic services
CARS	Cockpit audio recording system
CAS	Calibrated airspeed
CAT I	Category I
CAT II	Category II
CAT III	Category III
CDL	Configuration deviation list
CFIT	Controlled flight into terrain
cm	Centimetre
COMAT	Operator material
CPDLC	Controller-pilot data link communications
CVR	Cockpit voice recorder
CVS	Combined vision system
DA	Decision altitude
DA/H	Decision altitude/height
DC	Direct current
D-FIS	Data link-flight information services
DH	Decision height

DLR	Data link recorder
DLRS	Data link recording system
DME	Distance measuring equipment
DSTRK	Desired track
EDTO	Extended diversion time operations
EFB	Electronic flight bag
EFIS	Electronic flight instrument system
EGT	Exhaust gas temperature
ELT	Emergency locator transmitter
ELT(AD)	Automatic deployable ELT
ELT(AF)	Automatic fixed ELT
ELT(AP)	Automatic portable ELT
ELT(S)	Survival ELT
EPR	Engine pressure ratio
EUROCAE	European Organisation for Civil Aviation Equipment
EVS	Enhanced vision system
FANS	Future air navigation system
FDAP	Flight data analysis programmes
FDR	Flight data recorder
FL	Flight level
FM	Frequency modulation
ft	Foot
ft/min	Feet per minute
g	Normal acceleration
GCAS	Ground collision avoidance system
GNSS	Global navigation satellite system
GPWS	Ground proximity warning system
hPa	Hectopascal
HUD	Head-up display
IFR	Instrument flight rules
ILS	Instrument landing system
IMC	Instrument meteorological conditions
inHg	Inch of mercury
INS	Inertial navigation system
ISA	International standard atmosphere
kg	Kilogram
kg/m ²	Kilogram per metre squared
km	Kilometre
km/h	Kilometre per hour
kt	Knot
kt/s	Knots per second
lb	Pound
lbf	Pound-force
LDA	Landing distance available
LED	Light emitting diode

m	Metre
mb	Millibar
MDA	Minimum descent altitude
MDA/H	Minimum descent altitude/height
MDH	Minimum descent height
MEL	Minimum equipment list
MHz	Megahertz
MLS	Microwave landing system
MMEL	Master minimum equipment list
MNPS	Minimum navigation performance specification
MOPS	Minimum operational performance specification
m/s	Metres per second
m/s ²	Metres per second squared
N	Newton
N ₁	Low pressure compressor speed (two-stage compressor); fan speed (three-stage compressor)
N ₂	High pressure compressor speed (two-stage compressor); intermediate pressure compressor speed (three-stage compressor)
N ₃	High pressure compressor speed (three stage compressor)
NAV	Navigation
NM	Nautical mile
NVIS	Night vision imaging systems
OCA	Obstacle clearance altitude
OCA/H	Obstacle clearance altitude/height
OCH	Obstacle clearance height
OEI	One-engine-inoperative
PANS	Procedures for Air Navigation Services
PBC	Performance-based communication
PBN	Performance-based navigation
PBS	Performance-based surveillance
RCP	Required communication performance
RNAV	Area navigation
RNP	Required navigation performance
RSP	Required surveillance performance
RTCA	Radio Technical Commission for Aeronautics
RVR	Runway visual range
RVSM	Reduced vertical separation minima
SOP	Standard operating procedure
SST	Supersonic transport
STOL	Short take-off and landing
SVS	Synthetic vision system
TAS	True airspeed
TAWS	Terrain awareness warning system
TCAS	Traffic alert and collision avoidance system
TLA	Thrust lever angle
TLS	Target level of safety
TVE	Total vertical error

UTC	Coordinated universal time
V _D	Design diving speed
VFR	Visual flight rules
VMC	Visual meteorological conditions
V _{MC}	Minimum control speed with the critical engine inoperative
VOR	VHF omnidirectional radio range
V _{s0}	Stalling speed or the minimum steady flight speed in the landing configuration
V _{s1}	Stalling speed or the minimum steady flight speed in a specified configuration
VTOL	Vertical take-off and landing
WXR	Weather

Symbols

°C	Degrees Celsius
%	Per cent

PUBLICATIONS

(referred to in this Annex)

ICAO Publications

Convention and Related Acts

Convention on International Civil Aviation (Doc 7300)

Protocol Relating to an Amendment to the Convention on International Civil Aviation (Article 83 bis) (Doc 9318)

Annexes to the Convention on International Civil Aviation

Annex 1 — Personnel Licensing

Annex 2 — Rules of the Air

Annex 3 — Meteorological Service for International Air Navigation

Annex 4 — Aeronautical Charts

Annex 5 — Units of Measurement to be Used in Air and Ground Operations

Annex 6 — Operation of Aircraft

Part II — International General Aviation — Aeroplanes

Part III — International Operations — Helicopters

Annex 7 — Aircraft Nationality and Registration Marks

Annex 8 — Airworthiness of Aircraft

Annex 9 — Facilitation

Annex 10 — Aeronautical Telecommunications

Volume III — Communication Systems (Part I — Digital Data Communication Systems; Part II — Voice Communication Systems)

Volume IV — Surveillance and Collision Avoidance Systems

Annex 11 — Air Traffic Services

Annex 12 — Search and Rescue

Annex 13 — Aircraft Accident and Incident Investigation

Annex 14 — Aerodromes

Volume I — Aerodrome Design and Operations

Annex 15 — Aeronautical Information Services

Annex 16 — Environmental Protection
Volume I — Aircraft Noise

Annex 18 — The Safe Transport of Dangerous Goods by Air

Annex 19 — Safety Management

Procedures for Air Navigation Services

ATM — Air Traffic Management (Doc 4444)

OPS — Aircraft Operations (Doc 8168)
Volume I — Flight Procedures
Volume II — Construction of Visual and Instrument Flight Procedures

TRG — Training (Doc 9868)

Regional Supplementary Procedures (Doc 7030)

Manuals¹

Aeronautical Surveillance Manual (Doc 9924)

Airport Services Manual (Doc 9137)
Part 1 — Rescue and Fire Fighting
Part 8 — Airport Operational Services

Airworthiness Manual (Doc 9760)

Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods (Doc 9481)

Extended Diversion Time Operations (EDTO) Manual (Doc 10085)

Flight Planning and Fuel Management (FPFM) Manual (Doc 9976)

Guidance for Safe Operations Involving Aeroplane Cargo Compartments (Doc 10102)

Human Factors Training Manual (Doc 9683)

Manual for the Oversight of Fatigue Management Approaches (Doc 9966)

Manual of Aircraft Ground De-icing/Anti-icing Operations (Doc 9640)

Manual of All-Weather Operations (Doc 9365)

Manual of Criteria for the Qualification of Flight Simulation Training Devices (Doc 9625)

1. The manuals referenced will be updated as necessary to harmonize the terminology with that used in the new Annex 19.

Manual of Evidence-based Training (Doc 9995)

Manual of Procedures for Establishment and Management of a State's Personnel Licensing System (Doc 9379)

Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (Doc 8335)

Manual on a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (Doc 9574)

Manual on Aeroplane Upset Prevention and Recovery Training (Doc 10011)

Manual on Electronic Flight Bags (EFBs) (Doc 10020)

Manual on Flight Data Analysis Programmes (FDAP) (Doc 10000)

Manual on Location of Aircraft in Distress and Flight Recorder Data Recovery (Doc 10054)

Manual on the Implementation of Article 83 bis of the Convention on International Civil Aviation (Doc 10059)

Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869) (previously titled the *Manual on Required Communication Performance (RCP)*.)

Performance-based Navigation (PBN) Manual (Doc 9613)

Performance-based Navigation (PBN) Operational Approval Manual (Doc 9997)

Policy and Guidance Material on the Economic Regulation of International Air Transport (Doc 9587)

Preparation of an Operations Manual (Doc 9376)

Safety Management Manual (Doc 9859)

Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284)

Training Manual (Doc 7192)
Part D-3 — *Flight Operations Officers/Flight Dispatchers*

Circulars

Guidance Material on SST Aircraft Operations (Cir 126)

Other Publications

Aeronautical Radio, Incorporated (ARINC), ARINC 647A

European Organisation for Civil Aviation Equipment (EUROCAE) Documents ED-55, ED-56A, ED-76, ED-77, ED-112, ED-112A, ED-155 and ED-250

International Maritime Organization, International Regulations for Preventing Collisions at Sea

Radio Technical Commission for Aeronautics, RTCA DO-200A and RTCA DO-201A

ANNEX 6 — PART I

INTERNATIONAL COMMERCIAL AIR TRANSPORT — AEROPLANES

FOREWORD

Historical background

Standards and Recommended Practices for the Operation of Aircraft — International Commercial Air Transport were first adopted by the Council on 10 December 1948 pursuant to the provisions of Article 37 of the Convention on International Civil Aviation (Chicago, 1944) and designated as Annex 6 to the Convention. They became effective on 15 July 1949. The Standards and Recommended Practices were based on recommendations of the Operations Division at its first session in April 1946, which were further developed at the second session of the Division in February 1947.

Amendments to the Annex, which included additional Standards and Recommended Practices as well as modifications to existing Standards, and which were based on recommendations of the Operations Division at its third and fourth sessions in February–March 1949 and March–April 1951, were adopted by the Council on 5 December 1950 (Amendments 1–127), 4 December 1951 (Amendments 128–131), 28 November 1952 (Amendments 132 and 133), 2 December 1952 (Amendment 134), 20 October 1953 (Amendment 135), 23 February 1956 (Amendment 136), 8 May 1956 (Amendment 137) and 15 May 1956 (Amendment 138), and became effective on 1 June 1951, 1 May 1952, 1 April 1953, 1 May 1953, 1 March 1954, 1 July 1956, 1 September 1956 and 15 September 1956, respectively.

The Third Air Navigation Conference (Montréal, September–October 1956) made, among other things, a complete review of Chapter 5 of the Annex. As a result of those recommendations, their submission to all Contracting States, and their review by the Air Navigation Commission, a complete new text of Chapter 5 was adopted by the Council as Amendment 139 on 13 June 1957 and became effective on 1 October 1957.

Additionally, the Council adopted Amendment 140 on 13 June 1957, containing amendments to Chapter 6 covering the marking of break-in points on aircraft and the characteristics of navigation lights, to Chapter 8 respecting the qualification of persons to certify aircraft as airworthy, to Chapter 9 respecting the route and aerodrome qualification of pilots and to Chapter 10 respecting requirements for licensing of flight operations officers, which became effective on 1 October 1957. Subsequent to the issuance of the fifth edition, Amendment 141 (4.1.1 and 4.1.2) was adopted by the Council on 12 May 1958 and became applicable on 1 December 1958. On 8 December 1959 the Council adopted Amendment 142 relating to the provisions in Chapter 6 for the carriage of portable emergency radio transmitters. The Amendment became effective on 1 May 1960 and applicable on 1 August 1960. On 2 December 1960 the Council adopted Amendment 143 relating to the provisions in Chapter 4 for coordination of operational instructions involving a change in the air traffic control flight plan. The Amendment became effective on 1 April 1961 and applicable on 1 July 1961. On 24 March 1961 the Council adopted Amendment 144 relating to the establishment of limitations upon flight duty periods and provision of rest periods for flight crew members, and the Attachment to the Annex of guidance material on the establishment of flight time and flight duty period limitations and rest periods. The Amendment became effective on 1 August 1961 and applicable on 1 October 1961. The Council on 24 March 1961 approved Amendment 145 containing the Note under 6.2.2 a). On 13 December 1961 the Council adopted Amendments 146 and 147 and approved Amendment 148. These relate respectively to the modernizing of the specifications concerning the provision and use of oxygen supply systems, the installation of high intensity anti-collision lights on aeroplanes and to purely editorial changes respecting references to other documents. The Amendments became effective on 1 April 1962 and applicable on 1 July 1962. On 8 April 1963 the Council adopted Amendment 149. This Amendment related to the specification of the circumstances under which emergency and survival equipment shall be carried on long-range over-water flights. The Amendment became effective on 1 August 1963 and applicable on 1 November 1963.

As a result of the adoption of Amendment 150, a sixth edition of the Annex was published. This was necessitated by the extensive nature of the Amendment which followed recommendations of the Fourth Air Navigation Conference (Montréal, November–December 1965) for extensive revision of the Annex, chiefly with the aim of bringing it up to date to meet the operational needs of high performance turbo-jet aeroplanes. Furthermore, on the recommendation of the Conference, the applicability of the Annex is now limited to “aeroplanes” engaged in scheduled and non-scheduled international air transport operations. Previously this limitation applied only to non-scheduled international air transport operations. Amendment 150 was adopted by the Council on 14 December 1966, became effective on 14 April 1967 and applicable on 24 August 1967.

The Council, on 8 November 1967, adopted Amendment 151 which redefined “Aircraft” as a result of adoption by Council of Amendment 2 to Annex 7 to the Convention and amended 5.2.7.2.2 to cater for three-engined aeroplanes. The Amendment became effective on 8 March 1968 and applicable on 22 August 1968.

Amendment 152 was adopted by the Council on 23 January 1969. Besides revising certain paragraphs in Chapters 4, 7 and 8 to give them more precision, the Amendment also adds a provision in Chapter 4 which prohibits, when passengers are being carried, the in-flight simulation of emergency situations affecting the flight characteristics of the aeroplane. The opportunity presented by this Amendment was also taken to introduce changes to the Annex as a consequence of the adoption by the Council of a companion document — International Standards and Recommended Practices — *Operation of Aircraft* — Annex 6, Part II — *International General Aviation*. These changes consisted of designating this document, previously known as Annex 6, “Annex 6, Part I, First Edition”. Amendment 152 became effective on 23 May 1969 and applicable on 18 September 1969.

Consequent to the adoption of Annex 6, Part III, *International Operations — Helicopters*, an amendment to the title was introduced to indicate that Annex 6, Part I was applicable only to aeroplanes.

Table A shows the origin of subsequent amendments together with a list of the principal subjects involved and the dates on which the Annex and the amendments were adopted by the Council, when they became effective and when they became applicable.

Applicability

The present edition of Annex 6, Part I, contains Standards and Recommended Practices adopted by the International Civil Aviation Organization as the minimum Standards applicable to the operation of aeroplanes by operators authorized to conduct international commercial air transport operations. These international commercial air transport operations include scheduled international air services and non-scheduled international air transport operations for remuneration or hire.

In conjunction, these two types of operations include all international air transport operations conducted for remuneration or hire by aeroplanes. The distinction between them lies in the fact that scheduled international air services are especially provided for in the Convention in contradistinction to international air transport operations in general, of which non-scheduled international air transport operations for remuneration or hire were considered most urgently to require the establishment of International Standards and Recommended Practices. It is no longer considered necessary to differentiate in the Standards and Recommended Practices between scheduled international air services and non-scheduled international air transport operations.

The purpose of Annex 6, Part I, is to contribute to the safety of international air navigation by providing criteria of safe operating practice and to contribute to the efficiency and regularity of international air navigation by encouraging States to facilitate the passage over their territories of aeroplanes in international commercial air transport belonging to other States that operate in conformity with such Standards.

Chapter 5

An element of the safety of an operation is the intrinsic safety of the aircraft, that is, its level of airworthiness. The level of airworthiness of an aircraft is, however, not fully defined by the application of the airworthiness Standards of Annex 8, but also requires the application of those Standards in the present Annex that are complementary to them.

As originally adopted and also as amended by Amendments 1 to 138, the Annex contained a chapter “Aeroplane Operating Limitations” which included general provisions applicable to the operation of all aeroplanes within the scope of the Annex, a section or sections applicable to aeroplanes certificated in ICAO categories according to the then existent Annex 8, and a section applicable to aeroplanes not so certificated.

At its fourth session, the Operations Division, collaborating with the Airworthiness Division, made, in addition to the proposals that resulted in Amendments 128 to 133, recommendations concerning the use of a performance code as an alternative to the one prescribed for ICAO Category A aeroplanes in which some essential climb values had the status of Recommended Practices. Further, the Airworthiness Division made recommendations concerning certain aspects of the certification in ICAO categories. As a result of those recommendations, the Council, on 2 December 1952, adopted Amendment 134 (which became effective 1 May 1953), and approved the incorporation of the alternative performance code, but stated its belief that since agreement had not yet been reached on Standards covering performance, there existed no basis for certification in ICAO Category A. It urged the Contracting States to refrain from such certification pending the becoming effective of Standards on performance or until such time as the Council decides on the basic policy on airworthiness.

The Assembly at its seventh session (June 1953) endorsed the action already taken by the Council and the Air Navigation Commission to initiate a fundamental study of ICAO policy on international airworthiness and directed the Council to complete the study as rapidly as practicable.

In pursuing such study, the Air Navigation Commission was helped by an international body of experts designated as the “Airworthiness Panel”, which contributed to the preparation of the work of the Third Air Navigation Conference.

As a result of these studies, a revised policy on international airworthiness was developed and it was approved by the Council in 1956. According to this policy the principle of certification in an ICAO Category was abandoned. Instead, Annex 8 included broad Standards which defined, for application by the competent national authorities, the complete minimum international basis for the recognition by States of certificates of airworthiness for the purpose of the flight of aircraft of other States into or over their territories, thereby achieving, among other purposes, protection of other aircraft, third persons and property. It was considered that this met the obligation of the Organization under Article 37 of the Convention to adopt international Standards of airworthiness.

It was recognized that the ICAO Standards of airworthiness would not replace national regulations and that national codes of airworthiness containing the full scope and extent of detail considered necessary by individual States would be necessary as the basis for the certification of individual aircraft. Each State would establish its own comprehensive and detailed code of airworthiness or would select a comprehensive and detailed code established by another Contracting State. The level of airworthiness defined by this code would be indicated by the Standards, supplemented, if necessary, by Acceptable Means of Compliance.

A revised text consistent with the above principles was prepared for Chapter 5 of Annex 6. It included: a) broad Standards that were complementary to the Standards related to aeroplane performance in Annex 8; and b) two Acceptable Means of Compliance which illustrated by examples the level of performance intended by the broad Standards. To adopt a code giving an appreciably lower level of performance than that illustrated by these Acceptable Means of Compliance was considered to be a violation of the Standards in Chapter 5 of this Annex.

Present policy on international airworthiness. There had been some concern about the slow progress that had been made over the years with respect to developing supplementary airworthiness specifications in the form of Acceptable Means of Compliance. It was noted that the majority of the Acceptable Means of Compliance in Annexes 6 and 8 had been developed in 1957 and were therefore applicable to only those aeroplane types operating at that time. No effort had been made to update the

specifications in these Acceptable Means of Compliance nor had there been any recommendations from the Airworthiness Committee for upgrading of any of the Provisional Acceptable Means of Compliance, which had been developed as potential material for full-fledged Acceptable Means of Compliance. The Air Navigation Commission therefore requested the Airworthiness Committee to review the progress made by it since its inception with a view to determining whether or not desired results had been achieved and to recommend any changes to improve the development of detailed airworthiness specifications.

The Airworthiness Committee at its Ninth Meeting (Montréal, November/December 1970) made a detailed study of the problems and recommended that the concept of developing airworthiness specifications in the form of Acceptable Means of Compliance and Provisional Acceptable Means of Compliance be abandoned and a provision be made for an airworthiness technical manual to be prepared and published by ICAO to include guidance material intended to facilitate the development and uniformity of national airworthiness codes by Contracting States.

The Air Navigation Commission reviewed the recommendations of the Airworthiness Committee in the light of the history of the development of the airworthiness policy approved by the Council in 1956. It came to the conclusion that the basic objectives and principles on which the ICAO airworthiness policy had been based were sound and did not require any significant change. It was also concluded that the main reason for the slow progress in the development of airworthiness specifications in the form of Acceptable Means of Compliance and Provisional Acceptable Means of Compliance was the degree of mandatory status to the former implied by the following statement included in the Forewords of Annexes 6 and 8:

“To adopt a code giving an appreciably lower level of airworthiness than that given in an Acceptable Means of Compliance would be a violation of the Standard supplemented by that Acceptable Means of Compliance.”

Several approaches were examined by the Air Navigation Commission to eliminate this difficulty. Finally, it came to the conclusion that the idea of developing airworthiness specifications in the form of Acceptable Means of Compliance and Provisional Acceptable Means of Compliance should be abandoned and ICAO should declare that the States' obligations, for the purpose of Article 33 of the Convention, shall be met by their compliance with the broad Standards in Annex 8 supplemented, as necessary, by airworthiness technical guidance material, devoid of all mandatory implications or obligations. Also the requirement that each Contracting State should either establish its own comprehensive and detailed code of airworthiness or select a comprehensive and detailed code established by another Contracting State should be retained.

The Council on 15 March 1972 approved the above approach to form the basis for the present policy of ICAO in the field of airworthiness.

It also approved the issuance of the airworthiness guidance material under the title of *Airworthiness Technical Manual*. It was understood that the guidance material would have no formal status and its main purpose would be to provide guidance to Contracting States in developing the detailed national airworthiness code mentioned in 2.2 of Part II of Annex 8.

With respect to Annex 6, Part I, it was agreed that the guidance material in the Acceptable Means of Compliance for Aeroplane Performance Operating Limitations should be edited suitably and retained in the Annex but in the form of an Attachment (green pages).

Performance Standards of Annex 8. Annex 8, Part IIIA, Chapter 2 and Part IIIB, Chapter 2 contain aeroplane performance Standards that are complementary to the Standards in Chapter 5 of this Annex. Both state broad objectives. The Council has urged Contracting States not to impose on visiting aeroplanes, not exempted by Article 41, operational requirements other than those established by the State of Registry, provided that those requirements assure the level of performance equivalent to that intended by the Standards of Chapter 5 of this Annex and the complementary Standards of Annex 8, Part IIIA, Chapter 2 and Part IIIB, Chapter 2.

In respect of aircraft exempted by Article 41, Chapter 5 of this Annex contains a Recommended Practice to the effect that the State of Registry should ensure that the level of performance specified in 5.2 applicable to aeroplanes not exempted should be met as far as practicable by those aeroplanes. The Council has urged Contracting States not to impose on visiting aircraft exempted by Article 41 requirements other than those established by the State of Registry provided that in establishing those

requirements the State of Registry complied with the Recommended Practice. These recommendations complement one made by the Council in respect of aircraft exempted by Article 41, to the effect that Contracting States apply as far as practicable to aeroplanes over 5 700 kg mass intended for the carriage of passengers or cargo or mail in international air navigation, the Standards of Parts IIIA and IIIB of Annex 8.

Action by Contracting States

Notification of differences. The attention of Contracting States is drawn to the obligation imposed by Article 38 of the Convention by which Contracting States are required to notify the Organization of any differences between their national regulations and practices and the International Standards contained in this Annex and any amendments thereto. Contracting States are invited to extend such notification to any differences from the Recommended Practices contained in this Annex, and any amendments thereto when the notification of such differences is important for the safety of air navigation. Further, Contracting States are invited to keep the Organization currently informed of any differences which may subsequently occur or of the withdrawal of any differences previously notified. A specific request for notification of differences will be sent to Contracting States immediately after the adoption of each Amendment to this Annex.

Attention of States is also drawn to the provision of Annex 15 related to the publication of differences between their national regulations and practices and the related ICAO Standards and Recommended Practices through the Aeronautical Information Service, in addition to the obligation of States under Article 38 of the Convention.

Promulgation of information. The establishment and withdrawal of and changes to facilities, services and procedures affecting aircraft operations provided in accordance with the Standards and Recommended Practices specified in this Annex should be notified and take effect in accordance with the provisions of Annex 15.

Status of Annex components

An Annex is made up of the following component parts, not all of which, however, are necessarily found in every Annex; they have the status indicated.

1.—Material comprising the Annex proper

- a) *Standards and Recommended Practices* adopted by the Council under the provisions of the Convention. They are defined as follows:

Standard: Any specification for physical characteristics, configuration, matériel, performance, personnel or procedure, the uniform application of which is recognized as necessary for the safety or regularity of international air navigation and to which Contracting States will conform in accordance with the Convention; in the event of impossibility of compliance, notification to the Council is compulsory under Article 38.

Recommended Practice: Any specification for physical characteristics, configuration, matériel, performance, personnel or procedure, the uniform application of which is recognized as desirable in the interest of safety, regularity or efficiency of international air navigation, and to which Contracting States will endeavour to conform in accordance with the Convention.

- b) *Appendices* comprising material grouped separately for convenience but forming part of the Standards and Recommended Practices adopted by the Council.
- c) *Definitions* of terms used in the Standards and Recommended Practices which are not self-explanatory in that they do not have accepted dictionary meanings. A definition does not have an independent status but is an essential part of each Standard and Recommended Practice in which the term is used, since a change in the meaning of the term would affect the specification.

- d) *Tables* and *Figures* which add to or illustrate a Standard or Recommended Practice and which are referred to therein, form part of the associated Standard or Recommended Practice and have the same status.

It is to be noted that some Standards in this Annex incorporate, by reference, other specifications having the status of Recommended Practices. In such cases, the text of the Recommended Practice becomes part of the Standard.

2.— *Material approved by the Council for publication in association with the Standards and Recommended Practices*

- a) *Forewords* comprising historical and explanatory material based on the action of the Council and including an explanation of the obligations of States with regard to the application of the Standards and Recommended Practices ensuing from the Convention and the Resolution of Adoption;
- b) *Introductions* comprising explanatory material introduced at the beginning of parts, chapters or sections of the Annex to assist in the understanding of the application of the text;
- c) *Notes* included in the text, where appropriate, to give factual information or references bearing on the Standards or Recommended Practices in question but not constituting part of the Standards or Recommended Practices;
- d) *Attachments* comprising material supplementary to the Standards and Recommended Practices or included as a guide to their application.

Selection of language

This Annex has been adopted in six languages — English, Arabic, Chinese, French, Russian and Spanish. Each Contracting State is requested to select one of those texts for the purpose of national implementation and for other effects provided for in the Convention, either through direct use or through translation into its own national language, and to notify the Organization accordingly.

Editorial practices

The following practice has been adhered to in order to indicate at a glance the status of each statement: *Standards* have been printed in light face roman; *Recommended Practices* have been printed in light face italics, the status being indicated by the prefix **Recommendation**; *Notes* have been printed in light face italics, the status being indicated by the prefix *Note*.

The following editorial practice has been followed in the writing of specifications: for Standards the operative verb “shall” is used, and for Recommended Practices the operative verb “should” is used.

The units of measurement used in this document are in accordance with the International System of Units (SI) as specified in Annex 5 to the Convention on International Civil Aviation. Where Annex 5 permits the use of non-SI alternative units, these are shown in parentheses following the basic units. Where two sets of units are quoted it must not be assumed that the pairs of values are equal and interchangeable. It may, however, be inferred that an equivalent level of safety is achieved when either set of units is used exclusively.

Any reference to a portion of this document, which is identified by a number and/or title, includes all subdivisions of that portion.

Throughout this Annex, the use of the male gender should be understood to include male and female persons.

In order to maintain a comprehensive edition of this Annex, the latest amendments have been consolidated in a new edition of the Annex. In so doing, provisions with particular applicability dates have been adjusted editorially, as appropriate.

Table A. Amendments to Annex 6, Part I

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
1st Edition	Derived from Sixth Edition of Annex 6, including Amendment 152		23 January 1969 23 May 1969 18 September 1969
1 (2nd Edition)	Sixth Air Navigation Conference	<ul style="list-style-type: none"> a) A shift in emphasis of the responsibility for the establishment of minimum en-route flight altitudes from the operator to the State flown over; b) the requirement for additional instruments in aeroplanes operated as controlled VFR flights in the en-route phase; and, of special importance; c) the permitting of aeroplanes, when unable to navigate by visual references to landmarks, to be navigated by equipment other than radio navigation equipment, e.g. solely by self-contained navigation means, provided that certain equipment capabilities are met, thus eliminating any requirement for the carriage of radio navigation equipment. 	25 May 1970 25 September 1970 4 February 1971
2	Special Meeting on Aircraft Noise in the Vicinity of Aerodromes (1969) and the Second Meeting of the Supersonic Transport Panel	<ul style="list-style-type: none"> a) The weight of an aeroplane at the start of take-off or at the expected time of landing not to exceed, except in prescribed circumstances, the relative maximum weights at which compliance has been demonstrated with the applicable Noise Certification Standards; b) the carriage on board an aeroplane of a document attesting noise certification; c) all aeroplanes intended to be operated above 15 000 m (49 000 ft) to carry equipment to measure and indicate continuously the total cosmic radiation being received. 	2 April 1971 2 August 1971 6 January 1972
3	Council action in pursuance of Assembly Resolution A17-10	Inclusion in the Annex of a Recommended Practice to the effect that, in all passenger-carrying aeroplanes, the flight crew compartment door should be capable of being locked from within the compartment.	10 December 1971 10 April 1972 7 December 1972
4 (3rd Edition)	Air Navigation Commission Review of the Annex	<ul style="list-style-type: none"> a) Deletion from Chapter 2 of the provision which allowed, in prescribed circumstances, certain specifications classed as Standards to have the status of Recommended Practices; b) introduction of the term “Aerodrome operating minima” in lieu of “Aerodrome meteorological minima”; c) introduction of the terms “Decision height”, “Instrument meteorological conditions”, “Runway visual range” and “Visual meteorological conditions”; d) introduction of provisions to require the operator to provide a copy of its Operations Manual to the State of Registry and to incorporate in the Manual certain mandatory material; e) the inclusion of an updated list of the supplies, etc., to be carried aboard aircraft in first-aid kits; f) a change in the equivalent of 5 700 kg from 12 500 lb to 12 566 lb; g) the introduction of a reference to the need for certain types of aeroplanes to be equipped with a Mach number indicator; h) the introduction of a provision for cabin attendants to be seated and secured during certain prescribed flight phases. 	27 June 1972 27 October 1972 1 March 1973

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
5	Seventh Air Navigation Conference	Inclusion in the Annex of definitions of “Flight recorder” and “Maximum weight” (of aircraft) and revision of the specifications for the carriage, recording parameters and operation of flight recorders.	29 May 1973 1 October 1973 23 May 1974
6	In pursuance of new policy on international airworthiness and action in pursuance of Assembly Resolution A18-16	Replacement of the Acceptable Means of Compliance on Aeroplane Performance Operating Limitations by guidance material on the subject in the form of an Attachment, and incorporation of provisions for emergency power supply to operate attitude indicating instruments on the total failure of the main electrical generating system. The opportunity presented by this Amendment was also taken to revise the Introductory Note to Chapter 3 of the Annex. The revision points to a practical method for States to discharge their functions in the cases of lease, charter, and interchange of aircraft in international operations.	30 October 1973 28 February 1974 23 May 1974
7	Council action in pursuance of Assembly Resolutions A17-10 and A18-10	Introduced provisions relating to practices to be followed in the event that an aircraft is being subjected to unlawful interference.	7 December 1973 7 April 1974 23 May 1974
8	Pursuant to an Air Navigation Commission study concerning the interception of civil aircraft	Introduced provisions designed to reduce the risk for intercepted aircraft.	4 February 1975 4 June 1975 9 October 1975
9	Accident Investigation and Prevention Divisional Meeting (1974). Fifth Meeting of the Supersonic Transport Panel. Consequent to amendments to Annexes 3 and 14	Introduced requirements for the safeguarding and preservation of flight recorder records of aeroplanes involved in accidents and incidents, provision and use of flight crew restraining devices, procedures to be followed in the event of excessive cosmic radiation exposure during flight, and the maintenance of records for crew members on total cosmic radiation dosages. The Amendment also provided amplification of the specifications for the type of timepiece required for operations in accordance with Instrument Flight Rules and controlled VFR flights and provided a cross-reference to guidance material on SST fuel supplies. The opportunity presented by this Amendment was also taken to introduce changes to the Annex as a result of the adoption by the Council of amendments to companion documents — Annex 3 and Annex 14. These changes consist of the elimination of reference to PANS-MET and the revision of the definitions of Aerodrome, Runway Visual Range, Take-off Run Available and Landing Distance Available.	7 April 1976 7 August 1976 30 December 1976
10	ASIA/PAC Regional Air Navigation Meeting (1973)	The requirement for the carriage of survival radio equipment over those areas in which search and rescue would be especially difficult to be determined by States rather than Regional Air Navigation Agreement.	16 June 1976 16 October 1976 6 October 1977
11	Seventh Air Navigation Conference and Air Navigation Commission Study	Required the operator to establish operational procedures designed to ensure that an aeroplane conducting precision approaches crosses the threshold by a safe margin.	23 June 1977 23 October 1977 23 February 1978
12	Air Navigation Commission Study	Required the fitting of ground proximity warning systems to certain aeroplanes.	15 December 1977 15 April 1978 10 August 1978
13	Air Navigation Commission Study	Required the fitting of seats with safety harness and their use by cabin attendants assigned emergency evacuation duties.	13 December 1978 13 April 1979 29 November 1979

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
14	Air Navigation Commission Study	New definition of “operational control” and introduction of requirements for navigation equipment to meet minimum navigation performance specifications (MNPS)	2 April 1980 2 August 1980 27 November 1980
15	Air Navigation Commission Study	Revision of the provisions relating to exterior lights to align with new provisions in Annexes 2 and 8, and requirements to include a checklist of emergency and safety equipment, including instructions for its use, in the Operations Manual.	22 March 1982 22 July 1982 25 November 1982
16 (4th Edition)	Third and Fourth meetings of the Operations Panel, AGA Divisional Meeting (1981), amendments consequent to adoption of Annex 18 and an Air Navigation Study	Introduced provisions related to aircraft operating procedures for noise abatement, development and use of instrument flight procedures, authority and competence to taxi aeroplanes and refuelling with passengers on board. Changes to the Annex were introduced as a result of adoption by the Council of Annex 18 in respect to the carriage of dangerous goods and requirements for crew training programmes in their carriage in commercial aeroplanes. The provisions in respect of aerodromes operating minima were revised to clarify the requirements and to include a requirement for RVR information. Units of measurement were brought in line with the provisions of Annex 5, and the Note in Chapter 3 concerning lease, charter and interchange was updated.	29 March 1983 29 July 1983 24 November 1983
17	Accident Prevention and Investigation Divisional Meeting, AIG (1979)	Revision of the provisions relating to flight recorders. Introduction of related guidance material in an attachment.	6 March 1985 29 July 1985 21 November 1985
18	Seventh meeting of the Obstacle Clearance Panel, Air Navigation Commission studies and a proposal by a State	Provision of climb performance data with all engines operating; extended range operations by aeroplanes with two engines; the provision of obstacle data; take-off alignment distance accountability.	25 March 1986 27 July 1986 20 November 1986
19 (5th Edition)	Air Navigation Commission review of the Annex, Stage I. Third meeting of the Visual Flight Rules Operations Panel. Air Navigation Commission Study	<ul style="list-style-type: none"> a) Introduction of new definitions for commercial air transport operations, air operator certificate, master minimum equipment list and minimum equipment list. Introduction of revised definitions of aerial work and general aviation to Annex 6, Part I. Revision of the definition of alternate aerodrome to introduce take-off, en-route and destination alternate aerodromes; b) elimination of the differences between the specifications for scheduled and non-scheduled operations; c) introduction of the concept of the applicability of Annex 6, Part I to the operation of aeroplanes by operators authorized to conduct international commercial air transport operations; d) requirements for the issue of an air operator certificate and the introduction of guidance material; e) requirements for the development of minimum equipment lists and the introduction of guidance material; f) requirements for the specification of alternate aerodromes; g) requirement for the provision of an aircraft operating manual; h) requirement for the operator to establish an accident prevention and flight safety programme and specifications related to carry-on baggage; 	19 March 1990 30 July 1990 15 November 1990

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
		<ul style="list-style-type: none"> i) differentiation in Annex 6, Part I between operational and ATS flight plans; j) requirements for the pilot-in-command to demonstrate knowledge of long-range navigation procedures where appropriate; k) elimination of the term “controlled VFR flight” and recognition that a VFR flight may be a controlled flight; l) amendment to Chapter 13 — Security to make the recommendation on the provision of a lockable flight crew compartment door applicable to all aeroplanes rather than only passenger-carrying aeroplanes, to require guidance material to support the aeroplane search procedure checklist, and to require the operator to establish a training programme for employees in preventative measures and techniques in relation to acts of sabotage or unlawful interference; m) introduction of guidance material concerning flight data recording of important operational information in aeroplanes with electronic displays; n) revision of the requirements for the contents of the operations manual; o) requirements concerning carry-on baggage; p) change of the expression “flight check system” to “checklist”; 	
20	Fifth meeting of the Operations Panel, Seventh and Eighth meetings of the Review of the General Concept of Separation Panel, Accident Investigation Divisional meeting (AIG/1992), Third meeting of the Continuing Airworthiness Panel, Air Navigation Commission studies	<ul style="list-style-type: none"> a) Revision of definitions of aerodrome operating minima, decision altitude/height, minimum descent altitude/height and obstacle clearance altitude/height; b) introduction of new definitions for emergency locator transmitters (ELTs), required navigation performance (RNP) and RNP type; c) introduction of the definition for the classification of instrument approach and landing operations; d) introduction of a reference to the Continuing Airworthiness Manual; e) revision of the requirements concerning the use of engraving metal foil flight data recorders; f) introduction of carriage requirements for emergency locator transmitters (ELTs) to replace provisions regarding survival radio equipment and emergency location beacon; g) introduction of a requirement that the navigation equipment carried shall enable the aircraft to proceed in accordance with RNP types prescribed for the intended route(s) or areas(s), provisions to permit the uniform implementation of 300 m (1 000 ft) VSM above FL 290 and reference to the requirements relating to operations in RNP airspace in the operations manual; h) revision of the requirements concerning maintenance inspection, modifications and repairs and continuing airworthiness information. 	21 March 1994 25 July 1994 10 November 1994

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
21 (6th Edition)	Air Navigation Commission studies, Fourteenth meeting of the Dangerous Goods Panel, editorial amendment, text alignment with Annex 6, Part II and/or Part III, consequential amendment	<ul style="list-style-type: none"> a) Introduction of new and revised definitions for cabin attendant, flight manual, large aeroplane, operations manual and small aeroplane; b) revision of the provisions concerning operating facilities, flight preparation, flight time, flight duty periods and rest periods for crew members, oxygen supply and extended range operations (ETOPS); c) new requirements for determining the length of the runway available; d) revised and new provisions concerning ground proximity warning systems (GPWS), medical supplies, oxygen equipment for aeroplanes on high altitude flights; e) revision of the provisions concerning aeroplanes operated in accordance with instrument flight rules (IFR); f) inclusion of references to the ICAO <i>Manual of Criteria for the Qualification of Flight Simulators</i> (Doc 9625) and new requirements for the flight crew training programme concerning knowledge and skills related to human performance and limitations; g) revision of the denomination of flight operations officer to align with Annex 1; h) revision of the contents of the operations manual and new provisions concerning aerodrome operating minima, oxygen supply, flight and duty time limitations, departure contingency procedures, instructions for mass and balance control and instructions and training requirements for the avoidance of controlled flight into terrain (CFIT) and policy for the use of ground proximity warning systems (GPWS); i) new provisions on flight time, flight duty periods and rest periods for cabin attendants and revision of the provisions concerning training; and j) revised and new requirements related to the incorporation of security into aircraft design. 	8 March 1995 24 July 1995 9 November 1995
22	Fourth and Fifth meetings of the Secondary Surveillance Radar Improvements and Collision Avoidance Systems Panel (SICAS/4 and 5)	Requirements concerning pressure-altitude reporting transponders and carriage of airborne collision avoidance systems (ACAS).	19 February 1996 15 July 1996 7 November 1996
23 (7th Edition)	First meeting of the Flight Recorder Panel, Fourth meeting of the Continuing Airworthiness Panel, ICAO and Industry CFIT Task Force, Air Navigation Commission studies, Amendment 162 to Annex 1, Amendment 38 to Annex 11, editorial amendment	<ul style="list-style-type: none"> a) Introduction of new and revised definitions for aircraft operating manual, configuration deviation list, ETOPS en-route alternate, Human Factors principles, human performance, master minimum equipment list, maintenance, psychoactive substances and required navigation performance; b) revision of the notes concerning lease and interchange; c) new and revised requirements concerning flight recorders; d) introduction of a note concerning the use of psychoactive substances; e) new provisions concerning airborne forward-looking wind shear warning systems; 	19 March 1998 20 July 1998 5 November 1998

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
		<ul style="list-style-type: none"> f) new and revised provisions concerning continuing airworthiness to reflect the use of approved maintenance organizations and to clarify the responsibilities of the operator and the maintenance organization; g) new and revised provisions concerning the content of an operations manual relocated in an appendix and a new Recommended Practice for the carriage of the ground proximity warning system in piston-engined aeroplanes; h) new provisions concerning the responsibility of States with regard to supervision of operations subject to an air operator certificate, acceptance of an operations manual and establishment of a system for certification and continued surveillance of the operator; i) new provisions related to the de-icing/anti-icing of aircraft on the ground, aeroplane performance operating limitations, mass limitation, sensitive pressure altimeters and recent experience of the co-pilot; j) new provisions concerning the carriage of airborne collision avoidance (ACAS) systems and pressure-altitude reporting transponders; and k) new provisions concerning Human Factors. 	
24	Second meeting of the Flight Recorder Panel, 32nd Session of the Assembly, Air Navigation Commission studies	<ul style="list-style-type: none"> a) Change of terminology from “cabin attendant” to “cabin crew”; b) revised definitions; c) new provisions concerning the mandatory carriage of ELTs operating on 406 MHz and 121.5 MHz, the addition of a predictive terrain hazard warning function to the ground proximity warning system (GPWS) and the introduction of an implementation date for the recording of digital communications. 	15 March 1999 19 July 1999 4 November 1999
25	Air Navigation Commission studies	<ul style="list-style-type: none"> a) Revised definitions; and b) introduction of requirements for the provision of RVR and criteria for instrument approach operations, and revision of the duties of the pilot-in-command. 	15 March 2000 17 July 2000 2 November 2000
26 (8th Edition)	Second meeting of the Flight Recorder Panel, AIG Divisional Meeting (1999), Third meeting of the Global Navigation Satellite System Panel, Fifth meeting of the Continuing Airworthiness Panel, Air Navigation Commission studies	<ul style="list-style-type: none"> a) Update of the provisions pertaining to flight recorders, including the recording of digital communications; FDR requirements for new aircraft; revised parameter listings; introduction of two-hour duration CVRs; b) new provisions pertaining to flight data analysis programmes; c) amendment of the classification of instrument approach and landing operations; d) new provisions pertaining to approach with vertical guidance (APV) operations; e) new definitions and update of provisions pertaining to maintenance-related requirements; and f) translation into English of documents attesting noise certification. 	9 March 2001 16 July 2001 1 November 2001

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
27	Air Navigation Commission studies	a) Revised requirements for the ground proximity warning system (GPWS) and forward looking terrain avoidance function; and b) new and revised requirements for the incorporation of security into aircraft design.	15 March 2002 15 July 2002 28 November 2002
28	Separation and Airspace Safety Panel and Air Navigation Commission studies	a) New provision concerning language proficiency requirements; b) new definition and provision concerning an operator's flight safety documents system; c) new definition and provisions concerning the safety aspects of ground handling arrangements; d) authorization by the State of the Operator for operations in RNP airspace; and e) new provision concerning the content of an operations manual in regard to the airborne collision avoidance system (ACAS).	13 March 2003 14 July 2003 27 November 2003
29	Sixth meeting of the Operations Panel, and the Separation and Airspace Safety Panel	a) New definitions related to reduced vertical separation minimum (RVSM) operations and cruise relief pilots; b) new Standards 4.9.1 and 4.9.2, concerning single pilot operations under instrument flight rules (IFR) or at night; c) an exception to the operating limitations in 5.1.2 for approved single-engine turbine-powered aeroplanes; d) new Standards 5.4.1 and 5.4.2, specifying requirements for approval of commercial operations by single-engine turbine-powered aeroplanes in instrument meteorological conditions (IMC) or at night; e) new Standard 6.22, specifying aeroplane equipment requirements for single pilot operations under instrument flight rules (IFR) or at night; f) amendments to 7.2.4 regarding flight levels for reduced vertical separation minimum (RVSM) operations, and new Standards 7.2.5, 7.2.6 and 7.2.7, specifying the responsibility of the relevant State authority to take prompt and appropriate action if the monitoring results indicate that the height-keeping performance of a particular aircraft or an aircraft type group exceeds the prescribed limits; g) new Standards 7.4.1 and 7.4.2 concerning operator management of electronic navigation data products; h) amendments to Standards 9.4.1 and 9.4.2 concerning recent experience of the pilot-in-command, co-pilot and cruise relief pilot; i) amendments to Standards 9.4.3.5 and 9.4.3.6, concerning area, route and aerodrome qualifications of the pilot-in-command; j) new Standard 9.4.5.1 requiring States to specify requirements applicable to single pilot operations under the instrument flight rules or at night; k) a new Recommended Practice 9.4.5.2, specifying pilot-in-command experience and training requirements for single pilot operations under the instrument flight rules or at night;	9 March 2005 11 July 2005 24 November 2005

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
		l) amendments to Appendix 2, regarding the contents of operations manuals in relation to area, route and aerodrome qualifications of the pilot-in-command, and maximum crosswind and tailwind operating limits; and	
		m) a new Appendix 3 specifying additional requirements for approved operations by single-engine turbine-powered aeroplanes at night and/ or in IMC, and a new Appendix 4 regarding the height-keeping performance criteria for operations in RVSM airspace.	
30	First meeting of the Surveillance and Conflict Resolution Systems Panel, Second meeting of the Flight Crew Licensing and Training Panel, Fourteenth meeting of the Obstacle Clearance Panel, a proposal by the United States, Council request, Assembly Resolution A35-17, 35th Session of the Assembly, and the Eleventh Air Navigation Conference	a) The carriage of altitude encoders with higher resolution; b) pilot recent experience and proficiency check requirements, cross-crew qualification and cross-crediting of experience, evaluation of competency, threat and error management and the biannual pilot proficiency check; c) pilot awareness of operational requirements determined by procedure design; d) qualifications for flight operations officers/flight dispatchers and the critical elements of a State regulatory system; e) the carriage of a copy of the air operator certificate in aircraft; f) legal guidance for the protection of information from safety data collection and processing systems; and g) safety management provisions and references to new guidance material on the concept of acceptable level of safety.	14 March 2006 17 July 2006 23 November 2006
31	First meeting of the Operational Data Link Panel (OPLINKP/1), First meeting of the Surveillance and Conflict Resolution Systems Panel (SCRSP/1) and Air Navigation Commission study	a) Amendments to Standards to facilitate implementation of the available technology in relation to the use of automatic dependent surveillance — contract (ADS-C) and to the introduction of required communication performance (RCP) in the provision of air traffic services (ATS); b) amendment of existing provisions related to the mandatory carriage requirements of emergency locator transmitters (ELTs) as of 1 July 2008; and c) changes to Standards related to pressure-altitude data sources used by transponders as of 1 January 2009 and 1 January 2012.	14 March 2007 16 July 2007 22 November 2007 1 July 2008 1 January 2009 1 January 2012
32	Secretariat; Secretariat with the assistance of the Required Navigation Performance and Special Operational Requirements (RNPSOR) Study Group	a) Amendments to definitions and Standards and Recommended Practices to strengthen the oversight and requirements of foreign operators and to harmonize the air operator certificate in content and, as of 1 January 2010, in layout; and b) amendments to definitions and Standards to align required navigation performance (RNP) and area navigation (RNAV) terminology with the performance-based navigation (PBN) concept.	3 March 2008 20 July 2008 20 November 2008 1 January 2010
33-A	Seventh meeting of the Operations Panel (OPSP/7); Secretariat with the assistance of the Medical Provisions Study Group (MPSG)	a) Amendment to the definition of “approach and landing operations using instrument approach procedures” to show a reduced RVR requirement for CAT II and CAT IIIA and B; b) amendment to the provisions regarding limits for flight time, duty periods, flight duty periods and rest periods for fatigue management; c) new provisions for climbs and descents to reduce unnecessary ACAS II resolution advisories;	2 March 2009 20 July 2009 19 November 2009

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
		<ul style="list-style-type: none"> d) clarification of training requirements for cabin crews in the awareness of dangerous goods; e) clarification of fuel and oil requirements in 4.3.6.2 and 4.3.6.3 with respect to distinguishing these requirements for piston-engined aeroplanes and for turbine-engined aeroplanes (turbo-jet and turbo-propeller); f) updated guidance on the level of performance intended by the provisions of Chapter 5; g) new Note in Appendix 2, 2.1.21 on the need to implement instructions on the use of autopilots and auto-throttles in IMC as an essential part of the CFIT and ALAR programmes; and h) amendment introducing changes to Annex 6 in order to better reflect the contemporary needs regarding on-board medical supplies. 	
33-B	Secretariat	Amendment concerning the development of harmonized provisions relating to safety management by introducing a framework for the implementation and maintenance of a State safety programme as of 18 November 2010.	2 March 2009 20 July 2009 18 November 2010
34 (9th Edition)	Secretariat, with the assistance of the Separation and Airspace Safety Panel (SASP); ninth meeting of the Operations Panel Working Group of the Whole (OPSP/WG/ WHL/9); twelfth meeting of the Airworthiness Panel Working Group of the Whole (AIRP/WG/ WHL/12); Secretariat, with the assistance of the second meeting of the Flight Recorder Panel Working Group of the Whole (FLIRECP/WG/ WHL/2)	<ul style="list-style-type: none"> a) Amendment to the provisions concerning reduced vertical separation minimum (RVSM) long-term monitoring requirements; b) new provisions for head-up displays (HUD)/enhanced vision systems (EVS); c) amendment to provisions to provide consistency in propulsion terminology; and d) new and updated provisions regarding flight recorders. 	26 February 2010 12 July 2010 18 November 2010
35	Ninth and tenth meetings of the Operations Panel Working Group of the Whole (OPSP/WG/ WHL/9 and 10); Fatigue Risk Management Task Force (FRMSTF); Secretariat, in order to implement the Council mandate, pursuant to Assembly Resolution A37-9	<ul style="list-style-type: none"> a) amendment to the operational requirements related to the availability of rescue and fire-fighting services (RFFS) at departure, destination or alternate aerodromes; b) new requirements for the development and implementation of fatigue risk management systems; and c) a halon replacement agent in lavatory fire extinguishers on or after 31 December 2011 and 31 December 2016 for hand-held fire extinguishers. 	13 June 2011 30 October 2011 15 December 2011

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
36	Secretariat, with the assistance of the third meeting of the Flight Recorder Panel Working Group of the Whole (FLIRECP/WG/WHL/3); Secretariat, with the assistance of the Special Operations Task Force (SOTF); Secretariat, in consultation with the Operations Panel (OPSP)	Amendment concerning: a) carriage requirements for flight recorders; b) extended diversion time operations (EDTO); and c) fuel planning, in-flight fuel management and the selection of alternate aerodromes; d) minimum fuel and MAYDAY fuel declarations.	7 March 2012 16 July 2012 15 November 2012
37-A	Twelfth meeting of the Operations Panel Working Group of the Whole (OPSP/WG/WHL/12); Special Meeting of the Safety Management Panel (SMP/SM/1)	Amendment concerning: a) approach ban; b) the transfer of safety management provisions to Annex 19.	25 February 2013 15 July 2013 14 November 2013
37-B	Secretariat supported by the Approach Classification Task Force (ACTF) in coordination with the Aerodromes Panel (AP), the Instrument Flight Procedure Panel (IFPP), the Navigation Systems Panel (NSP) and the Operations Panel (OPSP)	Amendment concerning provisions related to instrument approach operations and procedures as a result of the new approach classification.	25 February 2013 15 July 2013 13 November 2014
38	Secretariat; seventh, eighth, ninth, tenth and eleventh meetings of the Instrument Flight Procedures Panel Working Group of the Whole (IFPP/WG-WHL/7, 8, 9, 10 and 11); fifteenth meeting of the Operations Panel Working Group of the Whole (OPSP/WG/WHL/15); fifth meeting of the Flight Recorder Panel Working Group of the Whole (FLIRECP/WG/WHL/5)	Amendment concerning: a) upset prevention and recovery training; b) procedure design criteria and charting requirements to support PBN; c) harmonization of provisions concerning EFBs, dangerous goods, HUDs and vision systems, and fuel use; d) flight recorder requirements to: include provisions for automatic deployable flight recorder containers; reference updated EUROCAE Minimum Operational Performance Specifications (MOPS); include the use of Class C lightweight airborne image recording systems (AIRS); and include less stringent inspection requirements for flight recorder systems.	3 March 2014 14 July 2014 13 November 2014

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
39	Second High-level Safety Conference (HLSC 2015) and Multidisciplinary Meeting regarding Global Flight Tracking (MMGFT)	Amendment concerning provisions related to normal aircraft tracking	10 November 2015 20 March 2016 8 November 2018
40-A (Tenth Edition)	Secretariat, with the assistance of the Fatigue Risk Management System Task Force (FRMSTF); first meeting of the Flight Operations Panel (FLTOSP/1); Secretariat, with the assistance of the seventh meeting of the Flight Recorder Panel (FLIRECP/7); second meeting of the Operational Data Link Panel (OPLINKP/2)	Amendment concerning: <ul style="list-style-type: none"> a) fatigue management approaches; b) harmonization and alignment of terms and language, updated performance-based navigation (PBN) provisions, enhanced vision systems (EVS), and cargo compartment fire suppression considerations for diversion; c) automatic deployable flight recorder (ADFR); flight recorder data recovery; extended duration of cockpit voice recorder; and location of aeroplane in distress; and d) performance-based communication and surveillance (PBCS). 	2 March 2016 11 July 2016 10 November 2016
40-B	Group of Experts on Protection of Accident and Incident Records (GEPAIR) stemming from the work of the Safety Information Protection Task Force (SIP TF); Secretariat, as a result of the amendment to Annex 19 proposed by the first meeting of the Safety Management Panel (SMP/1) and the Safety Information Protection Task Force (SIP TF)	Amendment concerning: <ul style="list-style-type: none"> a) protection of flight recorder recordings in normal operations; and b) protection of safety data, safety information and related sources. 	2 March 2016 11 July 2016 7 November 2019
40-C	Friction Task Force (FTF) of the Aerodrome Design and Operations Panel (ADOP)	Amendment concerning the use of an enhanced global reporting format for assessing and reporting runway surface conditions.	2 March 2016 11 July 2016 5 November 2020
41	39th Session of the Assembly	Amendment concerning the applicability date for halon agent replacement in portable fire extinguishers.	25 November 2016 2 February 2017 27 April 2017

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
42	Secretariat with the assistance of the Normal Aircraft Tracking Implementation Initiative/2 (NATII/2)	Amendment concerning a proposal developed by the Secretariat with the assistance of the Normal Aircraft Tracking Implementation Initiative/2 (NATII/2) to amend the Standards and Recommended Practices (SARPs) with the introduction of an additional SARP to facilitate the practical implementation of normal tracking provisions.	27 February 2017 10 July 2017 8 November 2018
43 (11th Edition)	Third meeting of the Flight Operations Panel (FLTOSP/3); ninth meeting of the Flight Recorder Specific Working Group (FLIRECSWG/9); Secretariat, in consultation with the Aviation Security Panel (AVSECP) and the FLTOSP; third and fourth meeting of the Airworthiness Panel (AIRP/3 and AIRP/4); Helicopter Fatigue Management Task Force (Heli FM TF) and recommendation by FLTOSP/3; Twelfth meeting of the Aeronautical Information Service (AIS) to Aeronautical Information Management (AIM) Study Group (AIS-AIMSG); and thirteenth meeting of the Instrument Flight Procedure Panel (IFPP/13)	<ul style="list-style-type: none"> a) guidance on rescue and fire-fighting services (RFFS) and helicopter refuelling; b) flight recorder requirements to include: flight crew-machine interface recordings including CVR and AIR erase function; additional FDR parameters to be recorded; and simplification of flight recorder provisions; c) security of the flight crew compartment; d) approval and global recognition of approved maintenance organizations (AMOs) (Phases I and II) and the introduction of the electronic aircraft maintenance records (EAMR) framework; e) harmonization and alignment of fatigue management SARPs; f) amendment as a result of the review and restructuring of Annex 15 — Aeronautical Information Services and the introduction of PANS-AIM (Doc 10066); and g) amendments as a result of the restructuring of the Procedures for Air Navigation Services — Aircraft Operations, Volume I — Flight Procedures (Doc 8168). 	7 March 2018 16 July 2018 8 November 2018
44	Fourth meeting of the Flight Operations Panel (FLTOSP/4); tenth and eleventh meetings of the Flight Recorder Specific Working Group (FLIRECSWG/10 and FLIRECSWG/11); and 40th Session of the Assembly.	<ul style="list-style-type: none"> a) all-weather operations, conflict zones, aerodrome operating minima, continuous descent final approach, harmonization of terms for authorizations, acceptance and approvals (AAA), cargo compartment, ground proximity warning system (GPWS), life jackets and Article 83 bis; b) recording duration for CARS, image and data link data to be recorded on FDR/CVR, reliable power source for lightweight flight recorders, additional parameters for ADRS, bit error rate recording inspections and DLR and DLRS recording inspections; c) recording of data link communications messages; and d) location of an aircraft in distress. 	6 March 2020 20 July 2020 5 November 2020

<i>Amendment</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted Effective Applicable</i>
45	Eighth Meeting of the 220th Session of the ICAO Council	Postponement of the applicability date of Amendment 40-C: Amendment concerning the use of an enhanced global reporting format for assessing and reporting runway surface conditions.	19 June 2020 30 September 2020 4 November 2021
46	Special meeting of the Flight Recorder Specific Working Group (FLIRECSWG).	Twenty-five hour recording duration for CVR.	4 November 2020 15 February 2021 25 March 2021
47 (12th edition)	Fifth and sixth meetings of the Flight Operations Panel (FLTOSP/5 and 6); and the twelfth meeting of the Flight Recorder Specific Working Group (FLIRECSWG/12).	a) the availability of flight recorder maintenance documentation and the recalibration intervals of flight data recorder (FDR) sensors; and b) extended diversion time operations (EDTO), infant life jackets, ground proximity warning systems (GPWS), runway overrun awareness and alerting systems (ROAAS) and operational credit.	7 March 2022 18 July 2022 3 November 2022
48	Secretariat, based on information provided by industry.	Location of an aeroplane in distress.	18 July 2022 18 November 2022 29 December 2022 1 January 2025

INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

CHAPTER 1. DEFINITIONS

When the following terms are used in the Standards and Recommended Practices for operation of aircraft in international commercial air transport, they have the following meanings:

Accelerate-stop distance available (ASDA). The length of the take-off run available plus the length of stopway, if provided.

Advanced aircraft. An aircraft with equipment in addition to that required for a basic aircraft for a given take-off, approach or landing operation.

Aerial work. An aircraft operation in which an aircraft is used for specialized services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement, etc.

Aerodrome. A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aerodrome operating minima. The limits of usability of an aerodrome for:

- a) take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions;
- b) landing in 2D instrument approach operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions; and
- c) landing in 3D instrument approach operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the type and/or category of the operation.

Aeroplane. A power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

Agreement summary. When an aircraft is operating under an Article 83 *bis* agreement between the State of Registry and another State, the agreement summary is a document transmitted with the Article 83 *bis* Agreement registered with the ICAO Council that identifies succinctly and clearly which functions and duties are transferred by the State of Registry to that other State.

Note.— The other State in the above definition refers to the State of the Operator for commercial air transport operations.

Aircraft. Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Aircraft operating manual. A manual, acceptable to the State of the Operator, containing normal, abnormal and emergency procedures, checklists, limitations, performance information, details of the aircraft systems and other material relevant to the operation of the aircraft.

Note.— The aircraft operating manual is part of the operations manual.

Aircraft tracking. A process, established by the operator, that maintains and updates, at standardized intervals, a ground-based record of the four dimensional position of individual aircraft in flight.

Air operator certificate (AOC). A certificate authorizing an operator to carry out specified commercial air transport operations.

Air traffic service (ATS). A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).

Airworthy. The status of an aircraft, engine, propeller or part when it conforms to its approved design and is in a condition for safe operation.

Alternate aerodrome. An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing where the necessary services and facilities are available, where aircraft performance requirements can be met and which is operational at the expected time of use. Alternate aerodromes include the following:

Take-off alternate. An alternate aerodrome at which an aircraft would be able to land should this become necessary shortly after take-off and it is not possible to use the aerodrome of departure.

En-route alternate. An alternate aerodrome at which an aircraft would be able to land in the event that a diversion becomes necessary while en route.

Destination alternate. An alternate aerodrome at which an aircraft would be able to land should it become either impossible or inadvisable to land at the aerodrome of intended landing.

Note.— The aerodrome from which a flight departs may also be an en-route or a destination alternate aerodrome for that flight.

Altimetry system error (ASE). The difference between the altitude indicated by the altimeter display, assuming a correct altimeter barometric setting, and the pressure altitude corresponding to the undisturbed ambient pressure.

Appropriate airworthiness requirements. The comprehensive and detailed airworthiness codes established, adopted or accepted by a Contracting State for the class of aircraft, engine or propeller under consideration.

Area navigation (RNAV). A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

Note.— Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.

Basic aircraft. An aircraft which has the minimum equipment required to perform the intended take-off, approach or landing operation.

Cabin crew member. A crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the pilot-in-command of the aircraft, but who shall not act as a flight crew member.

COMAT. Operator material carried on an operator's aircraft for the operator's own purposes.

Combined vision system (CVS). A system to display images from a combination of an enhanced vision system (EVS) and a synthetic vision system (SVS).

Commercial air transport operation. An aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.

Configuration deviation list (CDL). A list established by the organization responsible for the type design with the approval of the State of Design which identifies any external parts of an aircraft type which may be missing at the commencement of a flight, and which contains, where necessary, any information on associated operating limitations and performance correction.

Contaminated runway. A runway is contaminated when a significant portion of the runway surface area (whether in isolated areas or not) within the length and width being used is covered by one or more of the substances listed in the runway surface condition descriptors.

Note.— Further information on runway surface condition descriptors can be found in the Annex 14, Volume I — Definitions.

Continuing airworthiness. The set of processes by which an aircraft, engine, propeller or part complies with the applicable airworthiness requirements and remains in a condition for safe operation throughout its operating life.

Continuing airworthiness records. Records which are related to the continuing airworthiness status of an aircraft, engine, propeller or associated part.

Continuous descent final approach (CDFA). A technique, consistent with stabilized approach procedures, for flying the final approach segment (FAS) of an instrument non-precision approach (NPA) procedure as a continuous descent, without level-off, from an altitude/height at or above the final approach fix altitude/height to a point approximately 15 m (50 ft) above the landing runway threshold or the point where the flare manoeuvre begins for the type of aircraft flown; for the FAS of an NPA procedure followed by a circling approach, the CDFA technique applies until circling approach minima (circling OCA/H) or visual flight manoeuvre altitude/height are reached.

Crew member. A person assigned by an operator to duty on an aircraft during a flight duty period.

Cruise relief pilot. A flight crew member who is assigned to perform pilot tasks during cruise flight, to allow the pilot-in-command or a co-pilot to obtain planned rest.

Cruising level. A level maintained during a significant portion of a flight.

Dangerous goods. Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions.

Note.— Dangerous goods are classified in Annex 18, Chapter 3.

Decision altitude (DA) or decision height (DH). A specified altitude or height in a 3D instrument approach operation at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

Note 1.— Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.

Note 2.— The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In Category III operations with a decision height the required visual reference is that specified for the particular procedure and operation.

Note 3.— For convenience where both expressions are used they may be written in the form “decision altitude/height” and abbreviated “DA/H”.

Dry runway. A runway is considered dry if its surface is free of visible moisture and not contaminated within the area intended to be used.

Duty. Any task that flight or cabin crew members are required by the operator to perform, including, for example, flight duty, administrative work, training, positioning and standby when it is likely to induce fatigue.

Duty period. A period which starts when a flight or cabin crew member is required by an operator to report for or to commence a duty and ends when that person is free from all duties.

EDTO critical fuel. The fuel quantity necessary to fly to an en-route alternate aerodrome considering, at the most critical point on the route, the most limiting system failure.

Note.— Guidance on EDTO critical fuel scenarios is contained in the Extended Diversion Time Operations (EDTO) Manual (Doc 10085).

EDTO significant system. An aeroplane system whose failure or degradation could adversely affect the safety particular to an EDTO flight, or whose continued functioning is specifically important to the safe flight and landing of an aeroplane during an EDTO diversion.

Electronic flight bag (EFB). An electronic information system, comprised of equipment and applications for flight crew, which allows for the storing, updating, displaying and processing of EFB functions to support flight operations or duties.

Emergency locator transmitter (ELT). A generic term describing equipment which broadcast distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated. An ELT may be any of the following:

Automatic fixed ELT (ELT(AF)). An automatically activated ELT which is permanently attached to an aircraft.

Automatic portable ELT (ELT(AP)). An automatically activated ELT which is rigidly attached to an aircraft but readily removable from the aircraft.

Automatic deployable ELT (ELT(AD)). An ELT which is rigidly attached to an aircraft and which is automatically deployed and activated by impact, and, in some cases, also by hydrostatic sensors. Manual deployment is also provided.

Survival ELT (ELT(S)). An ELT which is removable from an aircraft, stowed so as to facilitate its ready use in an emergency, and manually activated by survivors.

Engine. A unit used or intended to be used for aircraft propulsion. It consists of at least those components and equipment necessary for functioning and control, but excludes the propeller/rotors (if applicable).

Enhanced vision system (EVS). A system to display electronic real-time images of the external scene achieved through the use of image sensors.

Note.— EVS does not include night vision imaging systems (NVIS).

Extended diversion time operations (EDTO). Any operation by an aeroplane with two or more turbine engines where the diversion time to an en-route alternate aerodrome is greater than the threshold time established by the State of the Operator.

Fatigue. A physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, and/or workload (mental and/or physical activity) that can impair a person's alertness and ability to perform safety-related operational duties.

Fatigue Risk Management System (FRMS). A data-driven means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles and knowledge as well as operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness.

Final approach segment (FAS). That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

Flight crew member. A licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period.

Flight data analysis. A process of analysing recorded flight data in order to improve the safety of flight operations.

Flight duty period. A period which commences when a flight or cabin crew member is required to report for duty that includes a flight or a series of flights and which finishes when the aircraft finally comes to rest and the engines are shut down at the end of the last flight on which he/she is a crew member.

Flight manual. A manual, associated with the certificate of airworthiness, containing limitations within which the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft.

Flight operations officer/flight dispatcher. A person designated by the operator to engage in the control and supervision of flight operations, whether licensed or not, suitably qualified in accordance with Annex 1, who supports, briefs and/or assists the pilot-in-command in the safe conduct of the flight.

Flight plan. Specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft.

Flight recorder. Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

Automatic deployable flight recorder (ADFR). A combination flight recorder installed on the aircraft which is capable of automatically deploying from the aircraft.

Flight safety documents system. A set of interrelated documentation established by the operator, compiling and organizing information necessary for flight and ground operations, and comprising, as a minimum, the operations manual and the operator's maintenance control manual.

Flight simulation training device. Any one of the following three types of apparatus in which flight conditions are simulated on the ground:

A flight simulator, which provides an accurate representation of the flight deck of a particular aircraft type to the extent that the mechanical, electrical, electronic, etc. aircraft systems control functions, the normal environment of flight crew members, and the performance and flight characteristics of that type of aircraft are realistically simulated;

A flight procedures trainer, which provides a realistic flight deck environment, and which simulates instrument responses, simple control functions of mechanical, electrical, electronic, etc. aircraft systems, and the performance and flight characteristics of aircraft of a particular class;

A basic instrument flight trainer, which is equipped with appropriate instruments, and which simulates the flight deck environment of an aircraft in flight in instrument flight conditions.

Flight time — aeroplanes. The total time from the moment an aeroplane first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight.

Note.— *Flight time as here defined is synonymous with the term “block to block” time or “chock to chock” time in general usage which is measured from the time an aeroplane first moves for the purpose of taking off until it finally stops at the end of the flight.*

General aviation operation. An aircraft operation other than a commercial air transport operation or an aerial work operation.

Ground handling. Services necessary for an aircraft’s arrival at, and departure from, an airport, other than air traffic services.

Head-up display (HUD). A display system that presents flight information into the pilot’s forward external field of view.

Human Factors principles. Principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

Human performance. Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

Instrument approach operations. An approach and landing using instruments for navigation guidance based on an instrument approach procedure. There are two methods for executing instrument approach operations:

- a) a two-dimensional (2D) instrument approach operation, using lateral navigation guidance only; and
- b) a three-dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance.

Note.— *Lateral and vertical navigation guidance refers to the guidance provided either by:*

- a) a ground-based radio navigation aid; or
- b) computer-generated navigation data from ground-based, space-based, self-contained navigation aids or a combination of these.

Instrument approach procedure (IAP). A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply. Instrument approach procedures are classified as follows:

Non-precision approach (NPA) procedure. An instrument approach procedure designed for 2D instrument approach operations Type A.

Note.— Non-precision approach procedures may be flown using a continuous descent final approach (CDFA) technique. CDFAs with advisory VNAV guidance calculated by on-board equipment are considered 3D instrument approach operations. CDFAs with manual calculation of the required rate of descent are considered 2D instrument approach operations. For more information on CDFAs, refer to PANS-OPS (Doc 8168), Volume I, Part II, Section 5.

Approach procedure with vertical guidance (APV). A performance-based navigation (PBN) instrument approach procedure designed for 3D instrument approach operations Type A.

Precision approach (PA) procedure. An instrument approach procedure based on navigation systems (ILS, MLS, GLS and SBAS CAT I) designed for 3D instrument approach operations Type A or B.

Note.— Refer to 4.2.8.3 for instrument approach operation types.

Instrument meteorological conditions (IMC). Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling,* less than the minima specified for visual meteorological conditions.

Note.— The specified minima for visual meteorological conditions are contained in Chapter 4 of Annex 2.

Isolated aerodrome. A destination aerodrome for which there is no destination alternate aerodrome suitable for a given aeroplane type.

Landing distance available (LDA). The length of runway which is declared available and suitable for the ground run of an aeroplane landing.

Large aeroplane. An aeroplane of a maximum certificated take-off mass of over 5 700 kg.

Low-visibility operations (LVO). Approach operations in RVRs less than 550 m and/or with a DH less than 60 m (200 ft) or take-off operations in RVRs less than 400 m.

Maintenance. The performance of tasks on an aircraft, engine, propeller or associated part required to ensure the continuing airworthiness of an aircraft, engine, propeller or associated part including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair.

Maintenance programme. A document which describes the specific scheduled maintenance tasks and their frequency of completion and related procedures, such as a reliability programme, necessary for the safe operation of those aircraft to which it applies.

Maintenance release. A document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner in accordance with appropriate airworthiness requirements.

* As defined in Annex 2.

Master minimum equipment list (MMEL). A list established for a particular aircraft type by the organization responsible for the type design with the approval of the State of Design containing items, one or more of which is permitted to be unserviceable at the commencement of a flight. The MMEL may be associated with special operating conditions, limitations or procedures.

Maximum diversion time. Maximum allowable range, expressed in time, from a point on a route to an en-route alternate aerodrome.

Maximum mass. Maximum certificated take-off mass.

Minimum descent altitude (MDA) or minimum descent height (MDH). A specified altitude or height in a 2D instrument approach operation or circling approach operation below which descent must not be made without the required visual reference.

Note 1.— Minimum descent altitude (MDA) is referenced to mean sea level and minimum descent height (MDH) is referenced to the aerodrome elevation or to the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. A minimum descent height for a circling approach is referenced to the aerodrome elevation.

Note 2.— The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In the case of a circling approach the required visual reference is the runway environment.

Note 3.— For convenience when both expressions are used they may be written in the form “minimum descent altitude/height” and abbreviated “MDA/H”.

Minimum equipment list (MEL). A list which provides for the operation of aircraft, subject to specified conditions, with particular equipment inoperative, prepared by an operator in conformity with, or more restrictive than, the MMEL established for the aircraft type.

Modification. A change to the type design of an aircraft, engine or propeller.

Note.— A modification may also include the embodiment of the modification which is a maintenance task subject to a maintenance release. Further guidance on aircraft maintenance — modification and repair is contained in the Airworthiness Manual (Doc 9760).

Navigation specification. A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

Required navigation performance (RNP) specification. A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.

Area navigation (RNAV) specification. A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

Note 1.— The Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, contains detailed guidance on navigation specifications.

Note 2.— The term RNP, previously defined as “a statement of the navigation performance necessary for operation within a defined airspace”, has been removed from this Annex as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this Annex is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refers to the aircraft and operating requirements, including a 4 NM lateral performance with on-board performance monitoring and alerting that are detailed in Doc 9613.

Night. The hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise, as may be prescribed by the appropriate authority.

Note.— Civil twilight ends in the evening when the centre of the sun's disc is 6 degrees below the horizon and begins in the morning when the centre of the sun's disc is 6 degrees below the horizon.

Obstacle clearance altitude (OCA) or obstacle clearance height (OCH). The lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria.

Note 1.— Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approach procedures to the aerodrome elevation or the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. An obstacle clearance height for a circling approach procedure is referenced to the aerodrome elevation.

Note 2.— For convenience when both expressions are used they may be written in the form “obstacle clearance altitude/height” and abbreviated “OCA/H”.

Operational control. The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.

Operational credit. A credit authorized for operations with an advanced aircraft enabling a lower aerodrome operating minimum than would normally be authorized for a basic aircraft, based upon the performance of advanced aircraft systems utilizing the available external infrastructure.

Operational flight plan. The operator's plan for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned.

Operations manual. A manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

Operations specifications. The authorizations including specific approvals, conditions and limitations associated with the air operator certificate and subject to the conditions in the operations manual.

Operator. The person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Operator's maintenance control manual. A document which describes the operator's procedures necessary to ensure that all scheduled and unscheduled maintenance is performed on the operator's aircraft on time and in a controlled and satisfactory manner.

Performance-based aerodrome operating minimum (PBAOM). A lower aerodrome operating minimum, for a given take-off, approach or landing operation, than is available when using a basic aircraft.

Note 1.— The PBAOM is derived by considering the combined capabilities of the aircraft and available ground facilities. Additional guidance material on PBAOM may be found in the Manual of All-Weather Operations (Doc 9365).

Note 2. — PBAOM may be based on operational credits.

Note 3.— PBAOM are not limited to PBN operations.

Performance-based communication (PBC). Communication based on performance specifications applied to the provision of air traffic services.

Note.— An RCP specification includes communication performance requirements that are allocated to system components in terms of the communication to be provided and associated transaction time, continuity, availability, integrity, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

Performance-based navigation (PBN). Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

Note.— Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.

Performance-based surveillance (PBS). Surveillance based on performance specifications applied to the provision of air traffic services.

Note.— An RSP specification includes surveillance performance requirements that are allocated to system components in terms of the surveillance to be provided and associated data delivery time, continuity, availability, integrity, accuracy of the surveillance data, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

Pilot-in-command. The pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight.

Point of no return. The last possible geographic point at which an aircraft can proceed to the destination aerodrome as well as to an available en-route alternate aerodrome for a given flight.

Pressure-altitude. An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Standard Atmosphere.*

Psychoactive substances. Alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents, whereas coffee and tobacco are excluded.

Repair. The restoration of an aircraft, engine, propeller or associated part to an airworthy condition in accordance with the appropriate airworthiness requirements, after it has been damaged or subjected to wear.

Required communication performance (RCP) specification. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication.

Required surveillance performance (RSP) specification. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance.

Rest period. A continuous and defined period of time, subsequent to and/or prior to duty, during which flight or cabin crew members are free of all duties.

Runway visual range (RVR). The range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

Safe forced landing. Unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface.

* As defined in Annex 8.