



ICAO

International Standards
and Recommended Practices

Annex 11 to the Convention on International Civil Aviation

Air Traffic Services

Air Traffic Control Service
Flight Information Service
Alerting Service

Fifteenth Edition, July 2018



This edition supersedes, on 8 November 2018, all previous editions of Annex 11.

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

Historical background

In October 1945, the Rules of the Air and Air Traffic Control (RAC) Division at its first session made recommendations for Standards, Practices and Procedures for Air Traffic Control. These were reviewed by the then Air Navigation Committee and approved by the Council on 25 February 1946. They were published as *Recommendations for Standards, Practices and Procedures — Air Traffic Control* in the second part of Doc 2010, published in February 1946.

The RAC Division, at its second session in December 1946 – January 1947, reviewed Doc 2010 and proposed Standards and Recommended Practices for Air Traffic Control. It did not appear possible, however, to finalize those Standards prior to basic principles being established by the RAC Division for the organization of the relevant services.

These were established by the RAC Division at its third session in April – May 1948 and a draft Annex was thereafter submitted to States. This was adopted by the Council on 18 May 1950, pursuant to Article 37 of the Convention on International Civil Aviation (Chicago, 1944), and designated as Annex 11 to the Convention with the title *International Standards and Recommended Practices — Air Traffic Services*. It became effective on 1 October 1950. This new title — *Air Traffic Services* — was preferred to the title *Air Traffic Control*, in order to make it clear that air traffic control service was a part of the services covered by Annex 11, together with flight information service and alerting service.

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 Standards and Recommended Practices in this document, together with the Standards in Annex 2, govern the application of the *Procedures for Air Navigation Services — Air Traffic Management* (Doc 4444, PANS-ATM) and the *Regional Supplementary Procedures — Rules of the Air and Air Traffic Services*, contained in Doc 7030, in which latter document will be found subsidiary procedures of regional application.

Annex 11 pertains to the establishment of airspace, units and services necessary to promote a safe, orderly and expeditious flow of air traffic. A clear distinction is made between air traffic control service, flight information service and alerting service. Its purpose, together with Annex 2, is to ensure that flying on international air routes is carried out under uniform conditions designed to improve the safety and efficiency of air operation.

The Standards and Recommended Practices in Annex 11 apply in those parts of the airspace under the jurisdiction of a Contracting State wherein air traffic services are provided and also wherever a Contracting State accepts the responsibility of providing air traffic services over the high seas or in airspace of undetermined sovereignty. A Contracting State accepting such responsibility may apply the Standards and Recommended Practices in a manner consistent with that adopted for airspace under its jurisdiction.

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 provisions 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. Information relating to the establishment and withdrawal of, and changes to, facilities, services and procedures affecting aircraft operations provided according to the Standards specified in this Annex should be notified and take effect in accordance with Annex 15.

Use of the text of the Annex in national regulations. The Council, on 13 April 1948, adopted a resolution inviting the attention of Contracting States to the desirability of using in their own national regulations, as far as practicable, the precise language of those ICAO Standards that are of a regulatory character and also of indicating departures from the Standards, including any additional national regulations that were important for the safety or regularity of air navigation. Wherever possible, the provisions of this Annex have been written in such a way as would facilitate incorporation, without major textual changes, into national legislation.

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 interests 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.

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*.

It is to be noted that in the English text the following practice has been adhered to when writing the specifications: Standards employ the operative verb “shall”, while Recommended Practices employ the operative verb “should”.

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 includes all subdivisions of that portion.

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 11

<i>Amendment(s)</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted/approved Effective Applicable</i>
1st Edition	Rules of the Air and Air Traffic Control (RAC) Division, Third Session (1948)	International Standards and Recommended Practices — <i>Air Traffic Services</i> .	18 May 1950 1 October 1950 1 June 1951
1 to 6 (2nd Edition)	Rules of the Air and Air Traffic Control (RAC) Division, Fourth Session (1950)	Aerodrome traffic; transfer of control; contents of clearance; distress phase; requirements for communications; upper flight information regions and upper control areas; vertical separation.	27 November 1951 1 April 1952 1 September 1952
7	Air Navigation Commission	Deletion of guidance material on the dissemination of information on ATS facilities.	22 February 1956 — —
8 (3rd Edition)	Second Air Navigation Conference (1955)	Definitions; establishment of authority; designations of airspace; separation of aircraft; requirements for communications; requirements for meteorological information; determination and establishment of controlled airspaces; diagrams of communications.	11 May 1956 15 September 1956 1 December 1956
9 (4th Edition)	Rules of the Air, Air Traffic Services and Search and Rescue (RAC/SAR) Divisions (1958)	Definitions; objectives of air traffic services; designations of airspace and controlled aerodromes; specifications for airspace; air traffic control service; alerting service; requirements for communications; determination and establishment of controlled airspaces, naming of reporting points; automation of air traffic control.	8 December 1959 1 May 1960 1 August 1960
10	Panel for Coordinating Procedures Respecting the Supply of Information for Air Operations (1959)	SIGMET information; delegation and application of flight information service; requirements for meteorological information.	2 December 1960 1 April 1961 1 July 1961
11	Air Navigation Commission	Deletion of guidance material illustrating the depiction on charts of air traffic services information.	26 June 1961 — —
12	Air Navigation Commission	Guidance material relating to the selection of designators for routes within controlled airspace.	15 December 1961 — —
13	Air Navigation Commission	Notification of rescue coordination centres during uncertainty, alert and distress phases.	13 April 1962 1 August 1962 1 November 1962
14	Air Navigation Commission	Requirements for other aircraft in the vicinity of an aircraft in a state of emergency to be informed of the nature of emergency.	19 June 1964 1 November 1964 1 February 1965
15 (5th Edition)	Rules of the Air, Air Traffic Services/Operations (RAC/OPS) Divisional Meeting (1963); Air Navigation Commission	Application of vertical separation for flights above FL 290; provision of air traffic control service to VFR flights; delineation of airspace; vertical limits of flight information regions; ATS routes and reporting point designators; coordination with operators; methods of separation; requirements for communications; guidance material on the determination and establishment of controlled airspace.	17 March 1965 29 March 1966 25 August 1966

<i>Amendment(s)</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted/approved Effective Applicable</i>
16	Air Traffic Control Automation Panel (ATCAP), Fifth Meeting (1966)	Transfer of responsibility for control; control of air traffic flow.	7 June 1967 5 October 1967 8 February 1968
17	Fifth Air Navigation Conference (1967)	Air traffic services reporting office and its communication requirements; clearances and separation; scope of the flight information service; communications for control of vehicles at aerodromes; ATS requirements for meteorological information; information on aerodrome conditions and operational status of navigation aids.	23 January 1969 23 May 1969 18 September 1969
18 (6th Edition)	Sixth Air Navigation Conference (1969); Air Navigation Commission	Definitions; terminology for designating controlled airspace; vertical limits of ATS airspaces; minimum flight altitudes; establishment and application of separation minima; clearances and separation; standard departure and arrival routes; establishment and identification of reporting points and reporting lines; provision of flight information service to IFR flights over water areas; establishment of air-ground communications for ATS purposes.	25 May 1970 25 September 1970 4 February 1971
19	Air Navigation Commission	Authority over aircraft over the high seas; SIGMET information.	15 November 1972 15 March 1973 16 August 1973
20	Seventh Air Navigation Conference (1972)	Definitions; area navigation (RNAV); designators for ATS routes and reporting points.	23 March 1973 30 July 1973 23 May 1974
21	Council action in pursuance of Assembly Resolutions A17-10 and A18-10	Practices to be followed by ATS units in the event that an aircraft is subjected to unlawful interference.	7 December 1973 7 April 1974 23 May 1974
22	Technical Panel on Supersonic Transport Operations (SSTP), Fourth Meeting (1973); Air Navigation Commission	Clearance for transonic acceleration and deceleration of supersonic flights; cooperation between military authorities and air traffic services and requirements for communications.	4 February 1975 4 June 1975 9 October 1975
23	Air Navigation Commission	Use of SSR code 7500 in the event of unlawful interference; requirements for communications between ATS units and meteorological offices.	12 December 1975 12 April 1976 12 August 1976
24	Air Navigation Commission	Definitions; time-keeping accuracy.	7 April 1976 7 August 1976 30 December 1976
25 (7th Edition)	Ninth Air Navigation Conference (1976)	Definitions; VOR change-over points; identification of ATS routes; establishment and identification of significant points; flight information service; ATS requirements for information.	7 December 1977 7 April 1978 10 August 1978
26	Air Navigation Commission	Designation of standard departure and arrival routes.	3 December 1979 3 April 1980 27 November 1980
27	Air Navigation Commission	Coordination of activities constituting a potential hazard to flights of civil aircraft; unmanned free balloons.	4 March 1981 4 July 1981 26 November 1981

<i>Amendment(s)</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted/approved Effective Applicable</i>
28	Air Navigation Commission	Requirements for communications between ATS units and military units.	1 April 1981 1 August 1981 26 November 1981
29	Operational Flight Information Service (OFIS) Panel, Second Meeting (1980); Review of the General Concept of Separation Panel (RGCSP), Fourth Meeting (1980); Air Navigation Commission	Provision of integrated AIS, ATS, MET and other pertinent operational information to aircraft in flight; composite separation; automatic recording of radar data; traffic information broadcasts by aircraft.	2 April 1982 2 August 1982 25 November 1982
30	ATS Data Acquisition, Processing and Transfer (ADAPT) Panel, Third Meeting (1981); AGA Divisional Meeting (1981); Air Navigation Commission	ATS requirements for communications; marking of surface wind indicators; surface movement guidance and control systems; units of measurement; definitions.	16 March 1983 29 July 1983 24 November 1983
31	Council; Air Navigation Commission	Civil-military coordination; in-flight contingencies involving strayed or unidentified aircraft and/or interception of civil aircraft; requirements for communications; traffic information broadcasts by aircraft.	12 March 1986 27 July 1986 20 November 1986
32 (8th Edition)	Review of the General Concept of Separation Panel (RGCSP), Fifth Meeting (1985); Air Navigation Commission	Definitions; Coordinated Universal Time (UTC); volcanic ash warnings; establishment of ATS routes defined by VOR; deletion of Attachments A, B, C, D, F and G.	18 March 1987 27 July 1987 19 November 1987
33 (9th Edition)	Secretariat; Visual Flight Rules Operations Panel, Third Meeting (1986); Air Navigation Commission; amendments consequential to the adoption of amendments to Annex 6	Operation of aircraft in mixed VFR/IFR; ATS requirements for NOTAM action; surface movement guidance and control; and ATS responsibilities regarding acts of unlawful interference.	12 March 1990 30 July 1990 14 November 1991
34	Secondary Surveillance Radar Improvements and Collision Avoidance Systems Panel, Fourth Meeting (SICASP/4) (1989)	Definitions; provision of air traffic services irrespective of airborne collision avoidance system (ACAS) operation.	26 February 1993 26 July 1993 11 November 1993
35 (10th Edition)	Review of the General Concept of Separation Panel (RGCSP), Sixth Meeting (1988), Seventh Meeting (1990), Eighth Meeting (1993); Automatic Dependent Surveillance Panel (ADSP), Second Meeting (1992); Air Navigation Commission	Definitions; reduced vertical separation minimum of 300 m (1 000 ft) vertical separation minimum above FL 290; integration of helicopter traffic with conventional aeroplane traffic; establishment of ATS routes defined by VOR and establishment of ATS routes for use by RNAV-equipped aircraft; required navigation performance; automatic dependent surveillance; provisions relating to the World Geodetic System — 1984 (WGS-84) geodetic datum; transmission of information to aircraft on radioactive material and toxic chemical “clouds”.	18 March 1994 25 July 1994 10 November 1994

<i>Amendment(s)</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted/approved Effective Applicable</i>
36	Fourth Meeting of the Secondary Surveillance Radar Improvements and Collision Avoidance Systems Panel (SICASP/4); Thirteenth and Fourteenth Meetings of the All Weather Operations Panel (AWOP/13 and 14); Tenth Meeting of the Obstacle Clearance Panel (OCP/10)	Pressure-altitude reporting transponders; microwave landing system; enroute obstacle clearance criteria.	8 March 1996 15 July 1996 7 November 1996
37 (11th Edition)	Air Navigation Commission; Amendment 70 to Annex 3	Aeronautical databases; AIRMET information; wind shear.	20 March 1997 21 July 1997 6 November 1997
38 (12th Edition)	Automatic Dependent Surveillance Panel, Fourth Meeting (1996); Review of the General Concept of Separation Panel, Ninth Meeting (1996); Amendment 71 to Annex 3; Air Navigation Commission	Definitions; automatic dependent surveillance systems and procedures; data interchange between automated ATS systems; ATS applications for air-ground data links; separation between aircraft; RNP and RNAV for en-route operations; requirements for the uplink of OPMET information to aircraft in flight; volcanic ash advisories; Human Factors.	19 March 1998 20 July 1998 5 November 1998
39	Air Navigation Commission	ATS airspace classifications; visual meteorological conditions; and minimum safe altitude warning.	10 March 1999 19 July 1999 4 November 1999
40 (13th Edition)	Air Navigation Commission; Fifth Meeting of the Automatic Dependent Surveillance Panel (ADSP/5); Thirty-ninth Meeting of the European Air Navigation Planning Group (EANPG); Twelfth Meeting of the Obstacle Clearance Panel (OCP/12); Amendments 25, 20 and 7 to Annex 6, Parts I, II and III, respectively; Secretariat	Definitions; ATS safety management; ADS to indicate state of aircraft emergency; flexible use of airspace; minimum flight altitudes; terrain clearance during radar vectoring; downstream clearance delivery service; transfer of responsibility for control; read-back of clearances; air traffic flow management; automatic terminal information service; VOLMET and D-VOLMET; equipment in ATS units and criteria for indicators(s) for RVR values; editorial amendments.	12 March 2001 16 July 2001 1 November 2001
41	Tenth meeting of the Review of the General Concept of Separation Panel (RGCSP/10); Seventeenth meeting of the Dangerous Goods Panel (DGP/17)	Spacing between parallel area navigation (RNAV) routes; and notification of dangerous goods information to rescue coordination centres (RCCs).	21 February 2002 15 July 2002 28 November 2002
42	Laser Emitters and Flight Safety Study Group; Secretariat; the Proficiency Requirements in Common English Study Group; Air Navigation Commission	Laser beam emissions; language proficiency requirements; and air traffic contingency measures.	7 March 2003 14 July 2003 27 November 2003

<i>Amendment(s)</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted/approved Effective Applicable</i>
43	Secretariat; Aeronautical Information Services/Aeronautical Charts (AIS/MAP) Divisional Meeting (1998)	Definitions; use of surface movement radar; ATS requirements for communications; meteorology information; height-keeping performance by aircraft; ATS safety management; electronic terrain and obstacle data; editorial amendments.	2 March 2005 11 July 2005 24 November 2005
44	35th Session of the ICAO Assembly; Eleventh Air Navigation Conference; Air Navigation Commission	ATS safety management; recording devices.	14 March 2006 17 July 2006 23 November 2006
45	Air Navigation Commission	Definitions and associated procedures for ADS-B, ADS-C and RCP; coordination procedures between ATS and other entities; name-code designators; introduction of wind shear alerts.	26 February 2007 16 July 2007 22 November 2007
46	Secretariat with the assistance of the RNPSOR Study Group; Report of the third meeting of the NSP Working Group of the Whole	Definitions and Standards to align required navigation performance (RNP) and area navigation (RNAV) terminology with the performance-based navigation (PBN) concept; make use of the latest GNSS terminology.	10 March 2008 20 July 2008 20 November 2008
47-A	Secretariat; Instrument Flight Procedures Panel first working group of the whole meeting (IFPP-WG/WHL/1)	Amendment to definitions; waypoint naming convention; air traffic services; and public health emergencies.	2 March 2009 20 July 2009 19 November 2009
47-B	Secretariat	Amendment to definitions; safety management system.	2 March 2009 20 July 2009 18 November 2010
48	Secretariat; Separation and Airspace Safety Panel (SASP); AIG Divisional Meeting (2008); Aerodrome Meteorological Observation and Forecast Study Group (AMOFSG)	Amendment to definitions and an abbreviation; reduced vertical separation minimum (RVSM) monitoring; use of fully automatic observing systems for the provision of local reports; and enhanced protection of electronic aeronautical data sets.	7 March 2012 16 July 2012 15 November 2012
49	Secretariat; AIS to AIM Study Group (AIS-AIMSG); Safety Management Panel (SMP)	Definitions; safety management system; integrity of aeronautical data; and identification and delineation of prohibited, restricted and danger areas.	25 February 2013 15 July 2013 14 November 2013
50-A (14th Edition)	Second meeting of the Operational Data Link Panel (OPLINKP/2); Twelfth meeting of the Instrument Flight Procedures Panel (IFPP/12); Meteorology (MET) Divisional Meeting (2014) (Recommendation 5/1 refers)	Provisions concerning performance-based communication and surveillance (PBCS); regulatory framework on instrument flight procedure design service; and consequential amendment concerning aeronautical meteorology.	22 February 2016 11 July 2016 10 November 2016

<i>Amendment(s)</i>	<i>Source(s)</i>	<i>Subject(s)</i>	<i>Adopted/approved Effective Applicable</i>
50-B	Twelfth Air Navigation Conference (AN-Conf/12, Recommendation 6/4) and the Secretariat, with the assistance of the Fatigue Risk Management System Task Force (FRMSTF)	Provisions concerning fatigue management for air traffic controllers.	22 February 2016 11 July 2016 5 November 2020
51 (15th Edition)	Twelfth meeting of the Aeronautical Information Service (AIS) Aeronautical Information Management (AIM) Study Group (AIS-AIMSG/12)	Consequential amendment resulting from proposed changes to Annex 15 and the introduction of PANS-AIM (Doc 10066) concerning change of references, data quality requirements and performance-based data error detection requirements.	9 March 2018 16 July 2018 8 November 2018

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INTERNATIONAL STANDARDS AND RECOMMENDED PRACTICES

CHAPTER 1. DEFINITIONS

Note 1.— Throughout the text of this document the term “service” is used as an abstract noun to designate functions, or service rendered; the term “unit” is used to designate a collective body performing a service.

Note 2.— The designation (RR) in these definitions indicates a definition which has been extracted from the Radio Regulations of the International Telecommunication Union (ITU) (see Handbook on Radio Frequency Spectrum Requirements for Civil Aviation including statement of approved ICAO policies (Doc 9718)).

When the following terms are used in the Standards and Recommended Practices for Air Traffic Services, they have the following meanings:

Accepting unit. Air traffic control unit next to take control of an aircraft.

Accident. An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

a) a person is fatally or seriously injured as a result of:

- being in the aircraft, or
- direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
- direct exposure to jet blast,

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

b) the aircraft sustains damage or structural failure which:

- adversely affects the structural strength, performance or flight characteristics of the aircraft, and
- would normally require major repair or replacement of the affected component,

except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome); or

c) the aircraft is missing or is completely inaccessible.

Note 1.— For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified, by ICAO, as a fatal injury.

Note 2.— An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.

Note 3.— The type of unmanned aircraft system to be investigated is addressed in Annex 13, 5.1.

Note 4.— Guidance for the determination of aircraft damage can be found in Annex 13, Attachment E.

ADS-C agreement. A reporting plan which establishes the conditions of ADS-C data reporting (i.e. data required by the air traffic services unit and frequency of ADS-C reports which have to be agreed to prior to using ADS-C in the provision of air traffic services).

Note.— The terms of the agreement will be exchanged between the ground system and the aircraft by means of a contract, or a series of contracts.

Advisory airspace. An airspace of defined dimensions, or designated route, within which air traffic advisory service is available.

Advisory route. A designated route along which air traffic advisory service is available.

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 control service. Air traffic control service for aerodrome traffic.

Aerodrome control tower. A unit established to provide air traffic control service to aerodrome traffic.

Aerodrome traffic. All traffic on the manoeuvring area of an aerodrome and all aircraft flying in the vicinity of an aerodrome.

Note.— An aircraft is in the vicinity of an aerodrome when it is in, entering or leaving an aerodrome traffic circuit.

Aeronautical fixed service (AFS). A telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services.

Aeronautical Information Publication (AIP). A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

Aeronautical mobile service (RR S1.32). A mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency position-indicating radio beacon stations may also participate in this service on designated distress and emergency frequencies.

Aeronautical telecommunication station. A station in the aeronautical telecommunication service.

Airborne collision avoidance system (ACAS). An aircraft system based on secondary surveillance radar (SSR) transponder signals which operates independently of ground-based equipment to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponders.

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.

Air-ground communication. Two-way communication between aircraft and stations or locations on the surface of the earth.

AIRMET information. Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of low-level aircraft operations and which was not already included in the forecast issued for low-level flights in the flight information region concerned or sub-area thereof.

Air-taxiing. Movement of a helicopter/VTOL above the surface of an aerodrome, normally in ground effect and at a ground speed normally less than 37 km/h (20 kt).

Note.— The actual height may vary, and some helicopters may require air-taxiing above 8 m (25 ft) AGL to reduce ground effect turbulence or provide clearance for cargo slingloads.

Air traffic. All aircraft in flight or operating on the manoeuvring area of an aerodrome.

Air traffic advisory service. A service provided within advisory airspace to ensure separation, in so far as practical, between aircraft which are operating on IFR flight plans.

Air traffic control clearance. Authorization for an aircraft to proceed under conditions specified by an air traffic control unit.

Note 1.— For convenience, the term “air traffic control clearance” is frequently abbreviated to “clearance” when used in appropriate contexts.

Note 2.— The abbreviated term “clearance” may be prefixed by the words “taxi,” “take-off,” “departure,” “en route,” “approach” or “landing” to indicate the particular portion of flight to which the air traffic control clearance relates.

Air traffic control service. A service provided for the purpose of:

- a) preventing collisions:
 - 1) between aircraft, and
 - 2) on the manoeuvring area between aircraft and obstructions; and
- b) expediting and maintaining an orderly flow of air traffic.

Air traffic control unit. A generic term meaning variously, area control centre, approach control unit or aerodrome control tower.

Air traffic controller schedule.[†] A plan for allocating air traffic controller duty periods and non-duty periods over a period of time, otherwise referred to as a roster.

Air traffic flow management (ATFM). A service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that ATC capacity is utilized to the maximum extent possible and that the traffic volume is compatible with the capacities declared by the appropriate ATS authority.

Air traffic service. 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).

[†] Applicable 5 November 2020.

Air traffic services airspace. Airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which air traffic services and rules of operation are specified.

Note.— *ATS airspaces are classified as Class A to G as described in 2.6.*

Air traffic services reporting office. A unit established for the purpose of receiving reports concerning air traffic services and flight plans submitted before departure.

Note.— *An air traffic services reporting office may be established as a separate unit or combined with an existing unit, such as another air traffic services unit, or a unit of the aeronautical information service.*

Air traffic services unit. A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.

Airway. A control area or portion thereof established in the form of a corridor.

ALERFA. The code word used to designate an alert phase.

Alerting service. A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.

Alert phase. A situation wherein apprehension exists as to the safety of an aircraft and its occupants.

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.*

Altitude. The vertical distance of a level, a point or an object considered as a point, measured from mean sea level.

Approach control service. Air traffic control service for arriving or departing controlled flights.

Approach control unit. A unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes.

Appropriate ATS authority. The relevant authority designated by the State responsible for providing air traffic services in the airspace concerned.

Apron. A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.

Apron management service. A service provided to regulate the activities and the movement of aircraft and vehicles on an apron.

Area control centre. A unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction.

Area control service. Air traffic control service for controlled flights in control areas.

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.

Area navigation route. An ATS route established for the use of aircraft capable of employing area navigation.

ATS route. A specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services.

Note 1.— The term “ATS route” is used to mean variously, airway, advisory route, controlled or uncontrolled route, arrival or departure route, etc.

Note 2.— An ATS route is defined by route specifications which include an ATS route designator, the track to or from significant points (waypoints), distance between significant points, reporting requirements and, as determined by the appropriate ATS authority, the lowest safe altitude.

Automatic dependent surveillance — broadcast (ADS-B). A means by which aircraft, aerodrome vehicles and other objects can automatically transmit and/or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link.

Automatic dependent surveillance — contract (ADS-C). A means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports.

Note.— The abbreviated term “ADS contract” is commonly used to refer to ADS event contract, ADS demand contract, ADS periodic contract or an emergency mode.

Automatic terminal information service (ATIS). The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof:

Data link-automatic terminal information service (D-ATIS). The provision of ATIS via data link.

Voice-automatic terminal information service (Voice-ATIS). The provision of ATIS by means of continuous and repetitive voice broadcasts.

Base turn. A turn executed by the aircraft during the initial approach between the end of the outbound track and the beginning of the intermediate or final approach track. The tracks are not reciprocal.

Note.— Base turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual procedure.

Calendar. Discrete temporal reference system that provides the basis for defining temporal position to a resolution of one day (ISO 19108*).

Change-over point. The point at which an aircraft navigating on an ATS route segment defined by reference to very high frequency omnidirectional radio ranges is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft.

Note.— Change-over points are established to provide the optimum balance in respect of signal strength and quality between facilities at all levels to be used and to ensure a common source of azimuth guidance for all aircraft operating along the same portion of a route segment.

Clearance limit. The point to which an aircraft is granted an air traffic control clearance.

Conference communications. Communication facilities whereby direct speech conversation may be conducted between three or more locations simultaneously.

Control area. A controlled airspace extending upwards from a specified limit above the earth.

Controlled aerodrome. An aerodrome at which air traffic control service is provided to aerodrome traffic.

Note.— The term “controlled aerodrome” indicates that air traffic control service is provided to aerodrome traffic but does not necessarily imply that a control zone exists.

Controlled airspace. An airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification.

Note.— Controlled airspace is a generic term which covers ATS airspace Classes A, B, C, D and E as described in 2.6.

Controlled flight. Any flight which is subject to an air traffic control clearance.

Controller-pilot data link communications (CPDLC). A means of communication between controller and pilot, using data link for ATC communications.

Control zone. A controlled airspace extending upwards from the surface of the earth to a specified upper limit.

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

Cyclic redundancy check (CRC). A mathematical algorithm applied to the digital expression of data that provides a level of assurance against loss or alteration of data.

Danger area. An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

Data accuracy. A degree of conformance between the estimated or measured value and the true value.

Data integrity (assurance level). A degree of assurance that an aeronautical data and its value has not been lost or altered since the origination or authorized amendment.

Data link communications. A form of communication intended for the exchange of messages via a data link.

* All ISO Standards are listed at the end of this chapter.

Data quality. A degree or level of confidence that the data provided meets the requirements of the data user in terms of accuracy, resolution and integrity (or equivalent assurance level), traceability, timeliness, completeness and format.

Datum. Any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities (ISO 19104*).

Declared capacity. A measure of the ability of the ATC system or any of its subsystems or operating positions to provide service to aircraft during normal activities. It is expressed as the number of aircraft entering a specified portion of airspace in a given period of time, taking due account of weather, ATC unit configuration, staff and equipment available, and any other factors that may affect the workload of the controller responsible for the airspace.

DETRESFA. The code word used to designate a distress phase.

Distress phase. A situation wherein there is reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger or require immediate assistance.

Downstream clearance. A clearance issued to an aircraft by an air traffic control unit that is not the current controlling authority of that aircraft.

Duty. [†] Any task that an air traffic controller is required by an air traffic services provider to perform. These tasks include those performed during time-in-position, administrative work and training.

Duty period. [†] A period which starts when an air traffic controller is required by an air traffic services provider to report for or to commence a duty and ends when that person is free from all duties.

Emergency phase. A generic term meaning, as the case may be, uncertainty phase, alert phase or distress phase.

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, knowledge and operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness.

Final approach. That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified,

a) at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or

b) at the point of interception of the last track specified in the approach procedure; and

ends at a point in the vicinity of an aerodrome from which:

1) a landing can be made; or

2) a missed approach procedure is initiated.

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

[†] Applicable 5 November 2020.

Flight information centre. A unit established to provide flight information service and alerting service.

Flight information region. An airspace of defined dimensions within which flight information service and alerting service are provided.

Flight information service. A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.

Flight level. A surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

Note 1.— A pressure type altimeter calibrated in accordance with the Standard Atmosphere:

- a) when set to a QNH altimeter setting, will indicate altitude;*
- b) when set to a QFE altimeter setting, will indicate height above the QFE reference datum;*
- c) when set to a pressure of 1 013.2 hPa, may be used to indicate flight levels.*

Note 2.— The terms “height” and “altitude”, used in Note 1 above, indicate altimetric rather than geometric heights and altitudes.

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

Note.— Specifications for flight plans are contained in Annex 2. When the expression “flight plan form” is used it denotes the model flight plan form at Appendix 2 to the PANS-ATM (Doc 4444).

Forecast. A statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace.

Geodetic datum. A minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system/frame.

Gregorian calendar. Calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar (ISO 19108*).

Note.— In the Gregorian calendar, common years have 365 days and leap years 366 days divided into twelve sequential months.

Height. The vertical distance of a level, a point or an object considered as a point, measured from a specified datum.

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.

IFR. The symbol used to designate the instrument flight rules.

IFR flight. A flight conducted in accordance with the instrument flight rules.

IMC. The symbol used to designate instrument meteorological conditions.

INCERFA. The code word used to designate an uncertainty phase.

Incident. An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

Note.— The types of incidents which are of main interest to the International Civil Aviation Organization for accident prevention studies are listed in Annex 13, Attachment C.

Instrument flight procedure design service. A service established for the design, documentation, validation, maintenance and periodic review of instrument flight procedures necessary for the safety, regularity and efficiency of air navigation.

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 Annex 2.

Integrity classification (aeronautical data). Classification based upon the potential risk resulting from the use of corrupted data. Aeronautical data is classified as:

- a) routine data: there is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;
- b) essential data: there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and
- c) critical data: there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.

International NOTAM office. An office designated by a State for the exchange of NOTAM internationally.

Level. A generic term relating to the vertical position of an aircraft in flight and meaning variously, height, altitude or flight level.

Manoeuvring area. That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

Meteorological office. An office designated to provide meteorological service for international air navigation.

Movement area. That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron(s).

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.

Non-duty period.[†] A continuous and defined period of time, subsequent to and/or prior to duty periods, during which the air traffic controller is free of all duties.

NOTAM. A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

Obstacle. All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

- a) are located on an area intended for the surface movement of aircraft; or
- b) extend above a defined surface intended to protect aircraft in flight; or
- c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

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

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.

Printed communications. Communications which automatically provide a permanent printed record at each terminal of a circuit of all messages which pass over such circuit.

[†] Applicable 5 November 2020.

Prohibited area. An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

Radio navigation service. A service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids.

Radiotelephony. A form of radiocommunication primarily intended for the exchange of information in the form of speech.

Reporting point. A specified geographical location in relation to which the position of an aircraft can be reported.

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.

Rescue coordination centre. A unit responsible for promoting efficient organization of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region.

Restricted area. An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.

Runway. A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

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.

Safety management system (SMS). A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies and procedures.

SIGMET information. Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations.

Significant point. A specified geographical location used in defining an ATS route or the flight path of an aircraft and for other navigation and ATS purposes.

Note.— There are three categories of significant points: ground-based navigation aid, intersection and waypoint. In the context of this definition, intersection is a significant point expressed as radials, bearings and/or distances from ground-based navigation aids.

Special VFR flight. A VFR flight cleared by air traffic control to operate within a control zone in meteorological conditions below VMC.

Station declination. An alignment variation between the zero degree radial of a VOR and true north, determined at the time the VOR station is calibrated.

Taxiing. Movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing.

Terminal control area. A control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes.

Time-in-position.[†] The period of time when an air traffic controller is exercising the privileges of the air traffic controller's licence at an operational position.

Track. The projection on the earth's surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic or grid).

Traffic avoidance advice. Advice provided by an air traffic services unit specifying manoeuvres to assist a pilot to avoid a collision.

Traffic information. Information issued by an air traffic services unit to alert a pilot to other known or observed air traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid a collision.

Transfer of control point. A defined point located along the flight path of an aircraft, at which the responsibility for providing air traffic control service to the aircraft is transferred from one control unit or control position to the next.

Transferring unit. Air traffic control unit in the process of transferring the responsibility for providing air traffic control service to an aircraft to the next air traffic control unit along the route of flight.

Uncertainty phase. A situation wherein uncertainty exists as to the safety of an aircraft and its occupants.

VFR. The symbol used to designate the visual flight rules.

VFR flight. A flight conducted in accordance with the visual flight rules.

Visual meteorological conditions (VMC). Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, equal to or better than specified minima.

Note.— The specified minima are contained in Annex 2.

VMC. The symbol used to designate visual meteorological conditions.

Waypoint. A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation. Waypoints are identified as either:

Fly-by waypoint. A waypoint which requires turn anticipation to allow tangential interception of the next segment of a route or procedure, or

Flyover waypoint. A waypoint at which a turn is initiated in order to join the next segment of a route or procedure.

[†] Applicable 5 November 2020.

* ISO Standard

19104 — *Geographic information — Terminology*

19108 — *Geographic information — Temporal schema*

CHAPTER 2. GENERAL

2.1 Establishment of authority

2.1.1 Contracting States shall determine, in accordance with the provisions of this Annex and for the territories over which they have jurisdiction, those portions of the airspace and those aerodromes where air traffic services will be provided. They shall thereafter arrange for such services to be established and provided in accordance with the provisions of this Annex, except that, by mutual agreement, a State may delegate to another State the responsibility for establishing and providing air traffic services in flight information regions, control areas or control zones extending over the territories of the former.

Note.— If one State delegates to another State the responsibility for the provision of air traffic services over its territory, it does so without derogation of its national sovereignty. Similarly, the providing State's responsibility is limited to technical and operational considerations and does not extend beyond those pertaining to the safety and expedition of aircraft using the concerned airspace. Furthermore, the providing State in providing air traffic services within the territory of the delegating State will do so in accordance with the requirements of the latter which is expected to establish such facilities and services for the use of the providing State as are jointly agreed to be necessary. It is further expected that the delegating State would not withdraw or modify such facilities and services without prior consultation with the providing State. Both the delegating and providing States may terminate the agreement between them at any time.

2.1.2 Those portions of the airspace over the high seas or in airspace of undetermined sovereignty where air traffic services will be provided shall be determined on the basis of regional air navigation agreements. A Contracting State having accepted the responsibility to provide air traffic services in such portions of airspace shall thereafter arrange for the services to be established and provided in accordance with the provisions of this Annex.

Note 1.— The phrase “regional air navigation agreements” refers to the agreements approved by the Council of ICAO normally on the advice of Regional Air Navigation Meetings.

Note 2.— The Council, when approving the Foreword to this Annex, indicated that a Contracting State accepting the responsibility for providing air traffic services over the high seas or in airspace of undetermined sovereignty may apply the Standards and Recommended Practices in a manner consistent with that adopted for airspace under its jurisdiction.

2.1.3 When it has been determined that air traffic services will be provided, the States concerned shall designate the authority responsible for providing such services.

Note 1.— The authority responsible for establishing and providing the services may be a State or a suitable Agency.

Note 2.— Situations which arise in respect of the establishment and provision of air traffic services to either part or whole of an international flight are as follows:

Situation 1: A route, or portion of a route, contained within airspace under the sovereignty of a State establishing and providing its own air traffic services.

Situation 2: A route, or portion of a route, contained within airspace under the sovereignty of a State which has, by mutual agreement, delegated to another State, responsibility for the establishment and provision of air traffic services.

Situation 3: A portion of a route contained within airspace over the high seas or in airspace of undetermined sovereignty for which a State has accepted the responsibility for the establishment and provision of air traffic services.

For the purpose of this Annex, the State which designates the authority responsible for establishing and providing the air traffic services is:

in Situation 1: *the State having sovereignty over the relevant portion of the airspace;*

in Situation 2: *the State to whom responsibility for the establishment and provision of air traffic services has been delegated;*

in Situation 3: *the State which has accepted the responsibility for the establishment and provision of air traffic services.*

2.1.4 Where air traffic services are established, information shall be published as necessary to permit the utilization of such services.

2.2 Objectives of the air traffic services

The objectives of the air traffic services shall be to:

- a) prevent collisions between aircraft;
- b) prevent collisions between aircraft on the manoeuvring area and obstructions on that area;
- c) expedite and maintain an orderly flow of air traffic;
- d) provide advice and information useful for the safe and efficient conduct of flights;
- e) notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.

2.3 Divisions of the air traffic services

The air traffic services shall comprise three services identified as follows.

2.3.1 The *air traffic control service*, to accomplish objectives a), b) and c) of 2.2, this service being divided in three parts as follows:

- a) *Area control service*: the provision of air traffic control service for controlled flights, except for those parts of such flights described in 2.3.1 b) and c), in order to accomplish objectives a) and c) of 2.2;
- b) *Approach control service*: the provision of air traffic control service for those parts of controlled flights associated with arrival or departure, in order to accomplish objectives a) and c) of 2.2;
- c) *Aerodrome control service*: the provision of air traffic control service for aerodrome traffic, except for those parts of flights described in 2.3.1 b), in order to accomplish objectives a), b) and c) of 2.2.

2.3.2 The *flight information service*, to accomplish objective d) of 2.2.

2.3.3 The *alerting service*, to accomplish objective e) of 2.2.

2.4 Determination of the need for air traffic services

2.4.1 The need for the provision of air traffic services shall be determined by consideration of the following:

- a) the types of air traffic involved;
- b) the density of air traffic;
- c) the meteorological conditions;
- d) such other factors as may be relevant.

Note.— Due to the number of elements involved, it has not been possible to develop specific data to determine the need for air traffic services in a given area or at a given location. For example:

- a) a mixture of different types of air traffic with aircraft of varying speeds (conventional jet, etc.) might necessitate the provision of air traffic services, whereas a relatively greater density of traffic where only one type of operation is involved would not;*
- b) meteorological conditions might have considerable effect in areas where there is a constant flow of air traffic (e.g. scheduled traffic), whereas similar or worse meteorological conditions might be relatively unimportant in an area where air traffic would be discontinued in such conditions (e.g. local VFR flights);*
- c) open stretches of water, mountainous, uninhabited or desert areas might necessitate the provision of air traffic services even though the frequency of operations is extremely low.*

2.4.2 The carriage of airborne collision avoidance systems (ACAS) by aircraft in a given area shall not be a factor in determining the need for air traffic services in that area.

2.5 Designation of the portions of the airspace and controlled aerodromes where air traffic services will be provided

2.5.1 When it has been determined that air traffic services will be provided in particular portions of the airspace or at particular aerodromes, then those portions of the airspace or those aerodromes shall be designated in relation to the air traffic services that are to be provided.

2.5.2 The designation of the particular portions of the airspace or the particular aerodromes shall be as follows:

2.5.2.1 *Flight information regions.* Those portions of the airspace where it is determined that flight information service and alerting service will be provided shall be designated as flight information regions.

2.5.2.2 *Control areas and control zones*

2.5.2.2.1 Those portions of the airspace where it is determined that air traffic control service will be provided to IFR flights shall be designated as control areas or control zones.

Note.— The distinction between control areas and control zones is made in 2.11.

2.5.2.2.1.1 Those portions of controlled airspace wherein it is determined that air traffic control service will also be provided to VFR flights shall be designated as Classes B, C, or D airspace.

2.5.2.2.2 Where designated within a flight information region, control areas and control zones shall form part of that flight information region.

2.5.2.3 *Controlled aerodromes.* Those aerodromes where it is determined that air traffic control service will be provided to aerodrome traffic shall be designated as controlled aerodromes.

2.6 Classification of airspaces

2.6.1 ATS airspaces shall be classified and designated in accordance with the following:

Class A. IFR flights only are permitted, all flights are provided with air traffic control service and are separated from each other.

Class B. IFR and VFR flights are permitted, all flights are provided with air traffic control service and are separated from each other.

Class C. IFR and VFR flights are permitted, all flights are provided with air traffic control service and IFR flights are separated from other IFR flights and from VFR flights. VFR flights are separated from IFR flights and receive traffic information in respect of other VFR flights.

Class D. IFR and VFR flights are permitted and all flights are provided with air traffic control service, IFR flights are separated from other IFR flights and receive traffic information in respect of VFR flights, VFR flights receive traffic information in respect of all other flights.

Class E. IFR and VFR flights are permitted, IFR flights are provided with air traffic control service and are separated from other IFR flights. All flights receive traffic information as far as is practical. Class E shall not be used for control zones.

Class F. IFR and VFR flights are permitted, all participating IFR flights receive an air traffic advisory service and all flights receive flight information service if requested.

Note.— Where air traffic advisory service is implemented, this is considered normally as a temporary measure only until such time as it can be replaced by air traffic control. (See also the PANS-ATM (Doc 4444), Chapter 9.)

Class G. IFR and VFR flights are permitted and receive flight information service if requested.

2.6.2 States shall select those airspace classes appropriate to their needs.

2.6.3 The requirements for flights within each class of airspace shall be as shown in the table in Appendix 4.

Note.— Where the ATS airspaces adjoin vertically, i.e. one above the other, flights at a common level would comply with requirements of, and be given services applicable to, the less restrictive class of airspace. In applying these criteria, Class B airspace is therefore considered less restrictive than Class A airspace; Class C airspace less restrictive than Class B airspace, etc.

2.7 Performance-based navigation (PBN) operations

2.7.1 In applying performance-based navigation, navigation specifications shall be prescribed by States. When applicable, the navigation specification(s) for designated areas, tracks or ATS routes shall be prescribed on the basis of regional air navigation agreements. In designating a navigation specification, limitations may apply as a result of navigation infrastructure constraints or specific navigation functionality requirements.

2.7.2 **Recommendation.**— *Performance-based navigation operations should be implemented as soon as practicable.*

2.7.3 The prescribed navigation specification shall be appropriate to the level of communications, navigation and air traffic services provided in the airspace concerned.

Note.— *Applicable guidance on performance-based navigation and implementation is published in the Performance-based Navigation (PBN) Manual (Doc 9613).*

2.8 Performance-based communication (PBC) operations

2.8.1 In applying performance-based communication (PBC), RCP specifications shall be prescribed by States. When applicable, the RCP specification(s) shall be prescribed on the basis of regional air navigation agreements.

Note. — *In prescribing an RCP specification, limitations may apply as a result of communication infrastructure constraints or specific communication functionality requirements.*

2.8.2 The prescribed RCP specification shall be appropriate to the air traffic services provided.

Note.— *Information on the performance-based communication and surveillance (PBCS) concept and guidance material on its implementation are contained in the Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869).*

2.9 Performance-based surveillance (PBS) operations

2.9.1 In applying performance-based surveillance (PBS), RSP specifications shall be prescribed by States. When applicable, the RSP specification(s) shall be prescribed on the basis of regional air navigation agreements.

Note.— *In prescribing an RSP specification, limitations may apply as a result of surveillance infrastructure constraints or specific surveillance functionality requirements.*

2.9.2 The prescribed RSP specification shall be appropriate to the air traffic services provided.

2.9.3 Where an RSP specification has been prescribed by States for performance-based surveillance, ATS units shall be provided with equipment capable of performance consistent with the prescribed RSP specification(s).

Note.— *Information on the PBCS concept and guidance material on its implementation are contained in the Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869).*

2.10 Establishment and designation of the units providing air traffic services

The air traffic services shall be provided by units established and designated as follows:

2.10.1 Flight information centres shall be established to provide flight information service and alerting service within flight information regions, unless the responsibility of providing such services within a flight information region is assigned to an air traffic control unit having adequate facilities for the discharge of such responsibility.

Note.— This does not preclude delegating to other units the function of providing certain elements of the flight information service.

2.10.2 Air traffic control units shall be established to provide air traffic control service, flight information service and alerting service within control areas, control zones and at controlled aerodromes.

Note.— The services to be provided by various air traffic control units are indicated in 3.2.

2.11 Specifications for flight information regions, control areas and control zones

2.11.1 **Recommendation.**— *The delineation of airspace, wherein air traffic services are to be provided, should be related to the nature of the route structure and the need for efficient service rather than to national boundaries.*

Note 1.— Agreements to permit the delineation of airspace lying across national boundaries are advisable when such action will facilitate the provision of air traffic services (see 2.1.1). Agreements which permit delineation of airspace boundaries by straight lines will, for example, be most convenient where data processing techniques are used by air traffic services units.

Note 2.— Where delineation of airspace is made by reference to national boundaries there is a need for suitably sited transfer points to be mutually agreed upon.

2.11.2 Flight information regions

2.11.2.1 Flight information regions shall be delineated to cover the whole of the air route structure to be served by such regions.

2.11.2.2 A flight information region shall include all airspace within its lateral limits, except as limited by an upper flight information region.

2.11.2.3 Where a flight information region is limited by an upper flight information region, the lower limit specified for the upper flight information region shall constitute the upper vertical limit of the flight information region and shall coincide with a VFR cruising level of the tables in Appendix 3 to Annex 2.

Note.— In cases where an upper flight information region is established the procedures applicable therein need not be identical with those applicable in the underlying flight information region.

2.11.3 Control areas

2.11.3.1 Control areas including, *inter alia*, airways and terminal control areas shall be delineated so as to encompass sufficient airspace to contain the flight paths of those IFR flights or portions thereof to which it is desired to provide the applicable parts of the air traffic control service, taking into account the capabilities of the navigation aids normally used in that area.

Note.— In a control area other than one formed by a system of airways, a system of routes may be established to facilitate the provision of air traffic control.

2.11.3.2 A lower limit of a control area shall be established at a height above the ground or water of not less than 200 m (700 ft).

Note.— This does not imply that the lower limit has to be established uniformly in a given control area (see Figure A-5 of the Air Traffic Services Planning Manual (Doc 9426), Part I, Section 2, Chapter 3).

2.11.3.2.1 **Recommendation.**— *The lower limit of a control area should, when practicable and desirable in order to allow freedom of action for VFR flights below the control area, be established at a greater height than the minimum specified in 2.11.3.2.*

2.11.3.2.2 **Recommendation.**— *When the lower limit of a control area is above 900 m (3 000 ft) MSL it should coincide with a VFR cruising level of the tables in Appendix 3 to Annex 2.*

Note.— This implies that the selected VFR cruising level be such that expected local atmospheric pressure variations do not result in a lowering of this limit to a height of less than 200 m (700 ft) above ground or water.

2.11.3.3 An upper limit of a control area shall be established when either:

- a) air traffic control service will not be provided above such upper limit; or
- b) the control area is situated below an upper control area, in which case the upper limit shall coincide with the lower limit of the upper control area.

When established, such upper limit shall coincide with a VFR cruising level of the tables in Appendix 3 to Annex 2.

2.11.4 Flight information regions or control areas in the upper airspace

Recommendation.— *Where it is desirable to limit the number of flight information regions or control areas through which high flying aircraft would otherwise have to operate, a flight information region or control area, as appropriate, should be delineated to include the upper airspace within the lateral limits of a number of lower flight information regions or control areas.*

2.11.5 Control zones

2.11.5.1 The lateral limits of control zones shall encompass at least those portions of the airspace, which are not within control areas, containing the paths of IFR flights arriving at and departing from aerodromes to be used under instrument meteorological conditions.

Note.— Aircraft holding in the vicinity of aerodromes are considered as arriving aircraft.

2.11.5.2 The lateral limits of a control zone shall extend to at least 9.3 km (5 NM) from the centre of the aerodrome or aerodromes concerned in the directions from which approaches may be made.

Note.— A control zone may include two or more aerodromes situated close together.

2.11.5.3 If a control zone is located within the lateral limits of a control area, it shall extend upwards from the surface of the earth to at least the lower limit of the control area.

Note.— An upper limit higher than the lower limit of the overlying control area may be established when desired.

2.11.5.4 **Recommendation.**— *If a control zone is located outside of the lateral limits of a control area, an upper limit should be established.*

2.11.5.5 **Recommendation.**— *If it is desired to establish the upper limit of a control zone at a level higher than the lower limit of the control area established above it, or if the control zone is located outside of the lateral limits of a control area, its upper limit should be established at a level which can easily be identified by pilots. When this limit is above 900 m (3 000 ft) MSL it should coincide with a VFR cruising level of the tables in Appendix 3 to Annex 2.*

Note.— This implies that, if used, the selected VFR cruising level be such that expected local atmospheric pressure variations do not result in a lowering of this limit to a height of less than 200 m (700 ft) above ground or water.

2.12 Identification of air traffic services units and airspace

2.12.1 **Recommendation.**— *An area control centre or flight information centre should be identified by the name of a nearby town or city or geographic feature.*

2.12.2 **Recommendation.**— *An aerodrome control tower or approach control unit should be identified by the name of the aerodrome at which it is located.*

2.12.3 **Recommendation.**— *A control zone, control area or flight information region should be identified by the name of the unit having jurisdiction over such airspace.*

2.13 Establishment and identification of ATS routes

2.13.1 When ATS routes are established, a protected airspace along each ATS route and a safe spacing between adjacent ATS routes shall be provided.

2.13.2 **Recommendation.**— *When warranted by density, complexity or nature of the traffic, special routes should be established for use by low-level traffic, including helicopters operating to and from helidecks on the high seas. When determining the lateral spacing between such routes, account should be taken of the navigational means available and the navigation equipment carried on board helicopters.*

2.13.3 ATS routes shall be identified by designators.

2.13.4 Designators for ATS routes other than standard departure and arrival routes shall be selected in accordance with the principles set forth in Appendix 1.

2.13.5 Standard departure and arrival routes and associated procedures shall be identified in accordance with the principles set forth in Appendix 3.

Note 1.— Guidance material relating to the establishment of ATS routes is contained in the Air Traffic Services Planning Manual (Doc 9426).

Note 2.— Guidance material relating to the establishment of ATS routes defined by VOR is contained in Attachment A.

Note 3.— The spacing between parallel tracks or between parallel ATS route centre lines based on performance-based navigation will be dependent upon the relevant navigation specification required.

2.14 Establishment of change-over points

2.14.1 Recommendation.— *Change-over points should be established on ATS route segments defined by reference to very high frequency omnidirectional radio ranges where this will assist accurate navigation along the route segments. The establishment of change-over points should be limited to route segments of 110 km (60 NM) or more, except where the complexity of ATS routes, the density of navigation aids or other technical and operational reasons warrant the establishment of change-over points on shorter route segments.*

2.14.2 Recommendation.— *Unless otherwise established in relation to the performance of the navigation aids or frequency protection criteria, the change-over point on a route segment should be the mid-point between the facilities in the case of a straight route segment or the intersection of radials in the case of a route segment which changes direction between the facilities.*

Note.— Guidance on the establishment of change-over points is contained in Attachment A.

2.15 Establishment and identification of significant points

2.15.1 Significant points shall be established for the purpose of defining an ATS route or instrument approach procedure and/or in relation to the requirements of air traffic services for information regarding the progress of aircraft in flight.

2.15.2 Significant points shall be identified by designators.

2.15.3 Significant points shall be established and identified in accordance with the principles set forth in Appendix 2.

2.16 Establishment and identification of standard routes for taxiing aircraft

2.16.1 Recommendation.— *Where necessary, standard routes for taxiing aircraft should be established on an aerodrome between runways, aprons and maintenance areas. Such routes should be direct, simple and where practicable, designed to avoid traffic conflicts.*

2.16.2 Recommendation.— *Standard routes for taxiing aircraft should be identified by designators distinctively different from those of the runways and ATS routes.*