

ФЕДЕРАЛЬНОЕ АГЕНТСТВО ВОЗДУШНОГО ТРАНСПОРТА  
ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ  
ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ  
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Кафедра специальной языковой подготовки

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## ПРОФЕССИОНАЛЬНО- ОРИЕНТИРОВАННЫЙ АНГЛИЙСКИЙ ЯЗЫК.

НАЦИОНАЛЬНЫЕ И РЕГИСТРАЦИОННЫЕ  
ЗНАКИ ВС. ЛЕТНАЯ ГОДНОСТЬ ВС. УПРОЩЕНИЕ  
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по проведению практических занятий

*для студентов III–IV курсов  
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## UNIT 1

### ANNEX 7 to the Convention on International Civil Aviation

#### Aircraft Nationality and Registration Marks

How are aircraft **classified** and **identified**, and how can you tell aircraft nationality? These are but two of the questions answered in the briefest ICAO Annex, which deals with aircraft nationality and registration marks, and, in a separate table, classifies aircraft by how they maintain **sustained flight** in the air.

The Annex is based on Articles 17 to 20 of the Chicago Convention. The ICAO Council adopted the first Standards concerning this issue in February 1949, based on recommendations from the first and second sessions of the **Airworthiness Division**, held in 1946 and 1947 respectively. Since then only four amendments have been made to the Annex. The latest edition is the fifth one, issued in 2003.

The first amendment introduced the definition of a "**rotorcraft**", and modified requirements related to the location of nationality and registration **marks on wings**. The second amendment redefined the word "aircraft", the use of which became effective in 1968; it also implemented a decision that all **air-cushion-type vehicles**, such as **hovercraft** and other **ground-effect machines**, should not be classified as aircraft. Since Article 77 of the Convention permits joint operating organizations, Amendment 3 was introduced to define "**Common Mark**", "**Common Mark Registering Authority**" and "**International Operating Agency**", to enable aircraft of international operating agencies to be registered on other than a national basis. The determining principle of the related provisions is that each international operating agency must be assigned a distinctive common mark by ICAO, this being selected from a series of symbols included in the **radio call signs** allocated by the **International Telecommunication Union (ITU)**.

The fourth amendment, adopted in 1981, introduces provisions related to registration and nationality marks for unmanned free balloons. The fifth amendment, adopted in 2003, introduces a new requirement for the **Certificate of Registration** to carry an English translation if issued in a language other than

English. The Annex sets out procedures for selection by ICAO Contracting States of nationality marks from the nationality symbols included in the radio call signs allocated to the States of Registry by the ITU. It sets standards for the use of letters, numbers and other graphic symbols to be used in the nationality and registration marks, and spells out where these characters will be located on different types of **airborne vehicles**, such as **lighter-than air aircraft** and **heavier-than-air aircraft**.

This Annex also calls for the registration of the aircraft, and provides a sample of this certificate for use by ICAO Contracting States. This certificate must be carried in the aircraft at all times, and an identification plate, bearing at least the aircraft's nationality, or common mark and registration mark, must be affixed in a prominent position to the main entrance. Years of considerable effort permit the classification of aircraft to be as simple as possible, and yet encompass as many types of flying machines as the human mind can devise.

## Vocabulary

aircraft nationality and registration marks – национальные и регистрационные знаки воздушных судов

to classify – классифицировать

to identify – идентифицировать

sustained flight – длительный полет

Airworthiness Division – совет по поддержанию летной годности

Rotorcraft – летательный аппарат с несущим винтом

marks on wings – обозначения на крыльях

air-cushion-type vehicle – транспортное средство на воздушной подушке

hovercraft – судно на воздушной подушке

ground-effect machine – аппарат, использующий эффект земли

Common Mark – общий знак

Common Mark Registering Authority – полномочный орган регистрирующий общий знак

International Operating Agency – международное эксплуатационное агентство

radio call sign – позывной радиосигнал

International Telecommunication Union (ITU) – Международный союз электросвязи

Certificate of Registration – регистрационное удостоверение

airborne vehicle – летательный аппарат

lighter-than air aircraft – воздушное судно легче воздуха

heavier-than-air aircraft – воздушное судно тяжелее воздуха

Exercise 1. Please, answer the questions below. Comprehensive answers are welcome.

- What are aircraft nationality and registration marks needed for?
- How was the Annex developed?
- Who allocates radio call signs?
- How many amendments are there to the Annex?
- Why were these amendments implemented?

Exercise 2. Please, fill in the blanks.

- The ICAO Council adopted the first Standards concerning this issue \_\_\_ February 1949, based \_\_\_ recommendations \_\_\_ the first and second sessions \_\_\_ the Airworthiness Division, held \_\_\_ 1946 and 1947 respectively. \_\_\_ then only four amendments have been made \_\_\_ the Annex.

- The Annex sets \_\_\_ procedures \_\_\_ selection by ICAO Contracting States \_\_\_ nationality marks \_\_\_ the nationality symbols included \_\_\_ the radio call signs allocated \_\_\_ the States of Registry \_\_\_ the ITU.

- This Annex also calls \_\_\_ the registration \_\_\_ the aircraft, and provides a sample \_\_\_ this certificate \_\_\_ use \_\_\_ ICAO Contracting States. This certificate must be carried \_\_\_ the aircraft \_\_\_ all times, and an identification plate, bearing \_\_\_ least the aircraft's nationality, \_\_\_ common mark \_\_\_ registration mark, must be affixed \_\_\_ a prominent position \_\_\_ the main entrance.

Exercise 3. Please, provide synonyms from the text for the following words and expressions.

- To deal with
- Amendment
- To permit
- Distinctive
- Selection

Exercise 4. Please, provide antonyms from the text for the following words and expressions.

- National basis
- To implement
- Unmanned free balloon
- At all times
- The first amendment

Exercise 5. Please, compose five sentences with words and expressions from Vocabulary provided (in written).

## UNIT 2

### ANNEX 8 to the Convention on International Civil Aviation

#### Airworthiness of Aircraft

In the interest of safety, an aircraft must be designed, constructed and operated in compliance with the appropriate airworthiness requirements of the State of Registry of the aircraft. Consequently, the aircraft is issued with a **Certificate of Airworthiness** declaring that the aircraft is fit to fly.

To facilitate the **import and export of aircraft**, as well as the exchange of aircraft for **lease, charter or interchange**, and to facilitate operations of aircraft in international air navigation, Article 33 of the Convention on International Civil Aviation places the burden on the State of Registry **to recognize and render valid** an airworthiness certificate issued by another Contracting State, subject to the condition that the airworthiness requirements under which such a certificate is issued or rendered valid are **equal to or above the minimum standards** which may be established by ICAO from time to time pursuant to the Convention. These minimum standards are contained in Annex 8, the first edition of which was adopted by the Council on 1 March 1949.

Annex 8 includes broad standards which define, for application by the national airworthiness authorities, the minimum basis for the recognition by States of Certificates of Airworthiness for the purpose of flight of aircraft of other States into and over their territories, thereby achieving, among other things, protection of other aircraft, third parties and property. It is recognized that ICAO Standards 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 required as the basis for the certification of individual aircraft. Each State is free to develop its own comprehensive and detailed code of airworthiness or to select, adopt or accept a comprehensive and detailed code established by another Contracting State. The level of airworthiness required to be maintained by a national code is indicated by the broad standards of Annex 8 supplemented, where necessary, by guidance material provided in ICAO's **Airworthiness Technical Manual** (Doc 9760).

Annex 8 is divided into four parts. Part I includes definitions; Part II deals with **procedures for certification** and continuing airworthiness of aircraft; Part III includes technical requirements for the certification of new large aeroplane designs; Part IV deals with helicopters.

One of the supporting clauses in the definitions used in the Annex defines the environment in which an aircraft is expected to perform as "**anticipated operating conditions**". These are conditions which are known from experience or which can be reasonably envisaged to occur during the operational life of the aircraft, taking into account the operations for which the aircraft is made eligible. They also include conditions relative to the weather, **terrain** surrounding the aerodromes from which the aircraft is expected to operate, functioning of the aircraft, efficiency of personnel and other factors affecting safety in flight. Anticipated operating conditions do not include those **extremes** which can be effectively avoided by operating procedures and those extremes which occur so infrequently that higher levels of airworthiness to meet them would render aircraft operations impracticable.

Under the provisions related to continuing airworthiness of aircraft, the **State of Registry** must inform the **State of Design** when it first enters in its register an aircraft of the type certified by the latter. This is to enable the State of Design to transmit to the State of Registry any generally applicable information it has found necessary for the continuing airworthiness and for the safe operation of the aircraft. The State of Registry must also transmit to the State of Design all continuing airworthiness information originated by it for transmission, as necessary, to other Contracting States known to have on their registers the same type of aircraft.

To assist States in establishing contact with appropriate national **airworthiness authorities**, necessary information has been provided in an **ICAO circular** (Circ 95) which is available on the ICAO-Net. The technical standards dealing with certification of aeroplanes are limited at present to **multi-engined aeroplanes** of over 5 700 kg **maximum certificated takeoff mass**. These standards include requirements related to performance, **flying qualities**, **structural design** and construction, engine and propeller design and **installation**, systems and equipment design and installation, and operating imitations including procedures and general information to be provided in the aeroplane **flight manual**, **crashworthiness** of aircraft and **cabin safety**, operating environment and human factors and security in aircraft design. The performance standards require that the aeroplane shall be capable of accomplishing the minimum performance specified in the Annex at all **phases of flight**, in the event that the critical **power-unit** has failed and the remaining power-units are operated within their **take-off power limitations**, be capable of safely continuing or **abandoning its take-off**. After the initial take-off



phase, the aeroplane must be capable of **continuing climb** up to a height at which the aeroplane can continue safe flight and landing, while the remaining power-units are operating within their continuous power limitations. The aeroplane must be **controllable** and **stable** under all anticipated operating conditions without exceptional skill, alertness or strength on the part of the pilot, even in the event of failure of any power-unit. Furthermore, the stall characteristics of the aeroplane must be such as to give the pilot **clear warning**, and it should be possible for the pilot to maintain full control of the aeroplane without altering engine power.

Requirements for detailed design and construction provide for a reasonable assurance that all aeroplane parts will function reliably and effectively. Functioning of all moving parts essential to safe operation must be demonstrated by suitable tests, and all materials used must conform to approved specifications. Methods of **fabrication** and **assembly** must produce a consistently sound structure which must be protected against **deterioration** or **loss of strength** due to **weathering**, **corrosion**, **abrasion** or other causes, which could pass unnoticed. Means must be provided which will automatically prevent emergencies or enable the crew to deal with them effectively, and design should minimize the possibility of **in-flight fires**, **cabin depressurization** and **toxic gases** in the aeroplane and the aircraft against **lightning** and **static electricity**.

Special consideration is given to requirements dealing with design features which affect the ability of the flight crew to maintain **controlled flight**. The layout of the flight crew compartment must be such as to minimize the possibility of incorrect operation of controls due to **confusion**, fatigue or **interference**. It should allow a sufficiently clear, extensive and undistorted field of vision for the safe operation of the aeroplane. Aeroplane design features also provide for the safety, health and wellbeing of occupants by providing an adequate cabin environment during the anticipated flight and ground and water operating conditions, the means for **rapid and safe evacuation** in **emergency landings** and the equipment necessary for the **survival** of the occupants following an emergency landing in the expected **external environment** for a reasonable time-span.

Requirements for the certification of engines and accessories are designed to ensure that they function reliably under the anticipated operating conditions. An engine of the type must be tested **to establish its power or thrust** from

characteristics, to ensure that operating parameters are satisfactory and to demonstrate adequate **margins of freedom from detonation, surge** or other **detrimental conditions**.

Tests must be of sufficient duration and must be conducted at such power and other operating conditions as are necessary to demonstrate the reliability and durability of the engine. Following the recent events of highjacking and terrorist acts on board aircraft, special **security features** have been included in aircraft design to improve the **protection of the aircraft**. These include special features in aircraft systems, **identification of a least-risk bomb location**, and **strengthening of the cockpit door**, ceilings and floors of **the cabin crew compartment**.

## Vocabulary

airworthiness of aircraft – летная годность воздушных судов

certificate of airworthiness – сертификат летной годности

import and export of aircraft – импорт и экспорт воздушного судна

lease, charter or interchange – лизинг, фрахтование или обмен воздушными судами

to recognize – признавать

to render valid – делать законным

equal to or above the minimum standards – соответствующий минимальным стандартам или превышающий их

national regulations – национальные правила

codes of airworthiness – нормы летной годности

Airworthiness Technical Manual – Руководство по летной годности

procedures for certification – процедуры сертификации

anticipated operating conditions – предполагаемые условия эксплуатации

terrain – зд. рельеф местности вокруг аэродрома

extremes – экстремальные условия

State of Registry – государство регистрации

State of Design 0 государство разработчика

airworthiness authorities – власти, отвечающие за поддержание летной годности

ICAO circular – циркуляр ИКАО

multi-engined aeroplanes – многодвигательный самолет

maximum certificated takeoff mass – максимальная сертифицированная взлетная масса

flying qualities – летные качества

structural design – проектирование конструкции

installation – установка

flight manual – руководство по летной эксплуатации

crashworthiness – аварийная безопасность

cabin safety – безопасность кабины

phases of flight – этапы полета

power-unit – силовая установка

take-off power limitations – ограничения взлетной мощности

to abandon take-off – прервать взлет

to continue climb – продолжать набор высоты

controllable – контролируемый

stable – стабильный

clear warning – ясное предупреждение

fabrication and assembly – производство и сборка

deterioration or loss of strength due to weathering, corrosion, abrasion – ухудшение состояния или потеря прочности из-за погодных условий, коррозии, трения

in-flight fires, cabin depressurization and toxic gases – пожар в воздухе, разгерметизация кабины и токсичные газы

lightning and static electricity – молния и статическое электричество

controlled flight – контролируемый полет

confusion, fatigue or interference – путаница, усталость или помехи

rapid and safe evacuation – быстрая и безопасная эвакуация

emergency landing – аварийное приземление

survival – выживание

external environment – внешняя среда, внешние условия

to establish its power or thrust – установить силу двигателя

margins of freedom from detonation, surge or other detrimental conditions – параметры исключения детонации, помпажа и других опасных явлений

duration – длительность

security features – средства безопасности

protection of aircraft – защита воздушного судна

identification of a least-risk bomb location – определение наименее опасных мест размещения бомбы

strengthening of the cockpit door – укрепление двери кабины экипажа

ceiling and floor of the cabin crew compartment – потолок и пол отсека кабинного экипажа

Exercise 1. Please, answer the questions below. Comprehensive answers are welcome.

- Which document confirms the airworthiness of an aircraft?
- Under which conditions is a Certificate of airworthiness issued?
- How many parts does Annex 8 provide and what are they about?
- What does ICAO Circular 95 serve for?

- How are crew cabins and compartments designed and why?

Exercise 2. Please, fill in the blanks.

- Annex 8 includes broad standards \_\_\_ define, \_\_\_ application \_\_\_ the national airworthiness authorities, the minimum basis \_\_\_ the recognition \_\_\_ States \_\_\_ Certificates \_\_\_ Airworthiness \_\_\_ the purpose \_\_\_ flight \_\_\_ aircraft \_\_\_ other States \_\_\_ and \_\_\_ their territories, \_\_\_ achieving, \_\_\_ other things, protection \_\_\_ other aircraft, third parties \_\_\_ property.

- Requirements \_\_\_ detailed design and construction provide \_\_\_ a reasonable assurance \_\_\_ all aeroplane parts will function reliably \_\_\_ effectively. Functioning \_\_\_ all moving parts essential to safe operation must be demonstrated \_\_\_ suitable tests, and all materials used must conform \_\_\_ approved specifications.

- Requirements \_\_\_ the certification \_\_\_ engines \_\_\_ accessories are designed to ensure \_\_\_ they function reliably \_\_\_ the anticipated operating conditions. An engine \_\_\_ the type must be tested to establish its power \_\_\_ thrust \_\_\_ characteristics, to ensure \_\_\_ operating parameters are satisfactory \_\_\_ to demonstrate adequate margins \_\_\_ freedom \_\_\_ detonation, surge \_\_\_ other detrimental conditions.

Exercise 3. Please, provide synonyms from the text for the following words and expressions.

- Airworthy
- To contain
- Supplement
- Special consideration
- To function reliably

Exercise 4. Please, provide antonyms from the text for the following words and expressions.

- Crashworthy
- Of sufficient duration
- Continuing airworthiness

- Fatigue
- To facilitate

Exercise 5. Please, compose five sentences with words and expressions from Vocabulary provided (in written).

## UNIT 3

### ANNEX 9 to the Convention on International Civil Aviation

#### Facilitation

The Standards and Recommended Practices (SARPs) on Facilitation (FAL) are derived from several provisions of the Chicago Convention. Article 37 **obliges** ICAO to adopt and amend from time to time international standards and recommended practices and procedures dealing with, inter alia, **customs** and **immigration procedures**. Article 22 obliges each Contracting State to adopt all practicable measures to facilitate and expedite navigation by aircraft between the territories of Contracting States, and to prevent unnecessary delays to aircraft, crews, passengers, and cargo, especially in the administration of the laws relating to immigration, **quarantine**, customs and **clearance**. Article 23 of the Convention expresses the undertaking of each

Contracting State to establish customs and immigration procedures affecting international air navigation in accordance with the practices established or recommended pursuant to the Convention.

A number of other articles have special pertinence to the provisions of the FAL Annex and have been taken into account in its preparation. These include: Article 10, which requires all aircraft **entering the territory** of a Contracting State **to land at, and depart from, an airport** designated by that State for customs and other **examination**; Article 13, which require compliance of a Contracting State's entry, clearance, immigration, passports, customs and quarantine laws and regulations, by or on behalf of passengers, crew or cargo; Article 14, which obliges each Contracting State to take effective measures **to prevent the spread** by means of

air navigation of **communicable diseases**; and Article 24 (customs duty), Article 29 (documents carried in aircraft) and Article 35 (cargo restrictions).

These provisions of the Convention find practical expression in the SARPs of Annex 9, the first edition of which was adopted in 1949. The SARPs pertain specifically to facilitation of landside formalities for **clearance of aircraft** and commercial traffic through the requirements of **customs, immigration, public health and agriculture authorities**. The Annex is a wide-ranging document which reflects the flexibility of ICAO in keeping pace with international civil aviation. ICAO is recognized as being the first international body to make a real start on facilitation by developing Standards which bind its Contracting States.

The Annex provides a **frame of reference** for planners and managers of international airport operations, describing maximum limits on obligations of industry and minimum facilities to be provided by governments. In addition, Annex 9 specifies methods and procedures for carrying out clearance operations in such a manner as to meet the twin objectives of effective compliance with the laws of States and productivity for the operators, airports and **government inspection agencies** involved.

Initially, the main thrust of the Annex consisted of efforts to reduce paperwork, standardize internationally the documents that were to accompany traffic between States, and simplify the procedures required to clear aircraft, passengers and cargo. It was—as it still is—recognized that delays due to cumbersome formalities must be reduced, not just because they are unpleasant but, in practical terms, because they are costly to all of the "customer groups" in the community and because they interfere with the success of everyone. Over the years, traffic volumes grew. States' resources for inspection regimes could not keep pace. The facilitation of landside clearance formalities became a much more complex issue. The focus of Annex 9 therefore changed. In its 11<sup>th</sup> edition (2002), the Annex 9 retained its original strategies, carried forward in all editions since the first, of **reducing paperwork, standardizing documentation and simplifying procedures**.

However, it shifted its focus to inspection techniques based on risk management, with the objectives to increase efficiency, reduce congestion in airports and

enhance security; to control abuses such as narcotics trafficking and travel document fraud; and to support the growth of international trade and tourism. In addition, new SARPs and guidance material were introduced to address certain high-profile issues of public interest such as the treatment of persons with disabilities. More recently, the face of facilitation has been further shaped by major developments in the civil aviation environment which have occurred during the last ten years (the mid-1990s and beyond). These phenomena include: technological progress, with the universal proliferation of the use of computers and electronic **data interchange systems**; massive increases in **illegal migration** which have become worldwide immigration and national security problems, with civil aviation the transport mode of choice and **passport fraud** a frequent tactic; and ongoing political and social upheaval, which has given rise to increased use of terrorism, in which **unlawful interference** with civil aviation is still a powerful technique for pursuing an objective.

These topics formed the basis of the agenda of the 12th Session of the **Facilitation Division** that was held in Cairo in early 2004 with the theme, “Managing Security Challenges to Facilitate Air Transport Operations.” Discussions on the essential role that facilitation measures play in the improvement of security led to the Division making recommendations on the security of travel documents and border control formalities, on modernized provisions for facilitation and security in air cargo service operations, on controlling travel document fraud and illegal migration and on **international health regulations and hygiene and sanitation in aviation**. The consequent 12th edition of Annex 9 (expected publication: 2005) reflects ICAO’s contemporary FAL strategy.

This is to advocate and support action by Contracting States in three principal areas: the standardization of travel documents, the rationalization of border clearance systems and procedures, and international cooperation to tackle security problems related to passengers and cargo. While the primary motivation of Annex 9 will continue to carry out the mandate in Article 22 of the Chicago Convention, “...to prevent unnecessary delays to aircraft, passengers and cargo...”, numerous provisions, developed with the intent to increase efficiency in control processes, support also the objective to raise the level of general security.



Enhancing the security of travel documents and tackling illegal migration are among the major changes introduced into Annex 9 through its 12th edition. Most of the existing Chapters and Appendices of the Annex remain more-or-less unchanged from the 11th edition. Two Chapters, in particular, have been substantially amended to reflect new international realities.

Chapter 3, which deals with the entry and departure of persons and baggage, now contains a Standard obliging Contracting States to regularly update security features in new versions of their travel documents, to guard against their misuse and to facilitate **detection** of cases where such documents have been unlawfully altered, replicated or issued. Another Standard requires States to establish controls on the lawful creation and issuance of travel documents. States are also now obliged to issue separate passports to all persons, regardless of age, and to issue them in **machine readable form**, in accordance with ICAO's specifications. States and airlines are required to collaborate in combatting travel document fraud. As for crew members, States are obliged to place adequate controls on the **issuance of crew member certificates** and other official **crew identity documents**. Finally, an entirely new Chapter 5 is devoted to the growing problem of **inadmissible persons** and **deportees**. The SARPs of this Chapter set out in clear terms the obligations of States and airlines *vis-à-vis* transport of potentially illegal migrants and similar "problem" cases that the international air transport industry comes across in ever greater numbers daily. Strict adherence by Contracting States of the obligations to remove from circulation fraudulent travel documents or genuine documents used fraudulently will greatly help to constrict the flow of illegal migrants the world over.

## Vocabulary

Facilitation – упрощение формальностей

**to oblige – обязать**

customs and immigration procedures – таможенные и миграционные процедуры

quarantine, customs and clearance – карантин, таможня и выпуск

entering the territory – вход в территорию

to land at an airport – прибывать в аэропорт

to depart from an airport – вылетать из аэропорта

examination- проверка

to prevent the spread – предотвратить распространение

communicable diseases – заразные болезни

clearance of aircraft – выпуск воздушного судна

customs, immigration, public health and agriculture authorities – органы власти таможенные, миграционные, в области здравоохранения и сельскохозяйственные

frame of reference – принцип классификации

government inspection agencies – государственные проверяющие ведомства

reducing paperwork, standardizing documentation and simplifying procedures – сокращение бумажной работы, стандартизация документов и упрощение процедур

data interchange system – система обмена данными

illegal migration – незаконная миграция

passport fraud – подделка паспортов

unlawful interference – незаконное вмешательство

Facilitation Division – Специализированное совещание по упрощению формальностей

international health regulations and hygiene and sanitation in aviation – международные медико-санитарные правила и вопросы гигиены и санитарии в авиации

detection – обнаружение

machine readable form – автоматически читаемая форма

issuance of crew member certificates – выдача свидетельств члена экипажа

crew identity documents – документы, подтверждающие личность члена экипажа

inadmissible persons and deportees – лица без права на въезд и депортируемые лица

Exercise 1. Please, answer the questions below. Comprehensive answers are welcome.

- What is facilitation and which procedures does it refer to?
- Against what should effective measures be taken at the same time?
- Why security of travel documents has to be enhanced?
- What was the session of Facilitation Division in Cairo in 2004 dedicated to?
- How is issuance of crew documents controlled?

Exercise 2. Please, fill in the blanks.

- The Annex provides a frame \_\_\_ reference \_\_\_ planners \_\_\_ managers \_\_\_ international airport operations, describing maximum limits \_\_\_ obligations \_\_\_ industry \_\_\_ minimum facilities \_\_\_ be provided \_\_\_ governments.
- Initially, the main thrust \_\_\_ the Annex consisted \_\_\_ efforts to reduce paperwork, standardize internationally the documents \_\_\_ were to accompany traffic \_\_\_ States, and simplify the procedures required \_\_\_ clear aircraft, passengers \_\_\_ cargo.
- \_\_\_ the years, traffic volumes grew. States' resources \_\_\_ inspection regimes could not keep pace. The facilitation \_\_\_ landside clearance formalities became a \_\_\_ more complex issue. The focus \_\_\_ Annex 9 therefore changed.

Exercise 3. Please, provide synonyms from the text for the following words and expressions.

- Administration
- Undertaking
- Fabrication and assembly

- Agenda
- Frame of reference

Exercise 4. Please, provide antonyms from the text for the following words and expressions.

- Facilitation
- Readable
- Inadmissible person
- To enhance
- Fraudulent travel documents

Exercise 5. Please, compose five sentences with words and expressions from Vocabulary provided (in written).

## UNIT 4

ANNEX 10 to the Convention on International Civil Aviation

Aeronautical Telecommunications

(Volumes I, II, III, IV and V)

Three of the most complex and essential elements of international civil aviation are aeronautical **communications**, **navigation** and **surveillance**. These elements are covered by Annex 10 to the Convention. Annex 10 is divided into five volumes:

**Volume I — Radio Navigation Aids**

**Volume II — Communications Procedures including those with PANS status**

**Volume III — Communication Systems**

**Part 1 — Digital Data Communication Systems**

**Part 2 — Voice Communication Systems**

**Volume IV — Surveillance Radar and Collision Avoidance Systems**

## Volume V — Aeronautical Radio Frequency Spectrum Utilization

The five volumes of this Annex contain Standards and Recommended Practices (SARPs), **Procedures for Air Navigation Services (PANS)** and guidance material on aeronautical communication, navigation and surveillance systems.

Volume I of Annex 10 is a **technical document** which defines for international aircraft operations the systems necessary to provide **radio navigation aids** used by aircraft in all **phases of flight**. The SARPs and guidance material of this volume list essential parameter specifications for radio navigation aids such as the **global navigation satellite system (GNSS)**, **instrument landing system (ILS)**, **microwave landing system (MLS)**, **very high frequency (VHF) omnidirectional radio range (VOR)**, **non-directional radio beacon (NDB)** and **distance measuring equipment (DME)**.

The information contained in this volume includes aspects of **power requirements**, frequency, **modulation**, **signal characteristics** and **monitoring** needed to ensure that suitably equipped aircraft will be able to receive navigation signals in all parts of the world with the **requisite degree of reliability**.

Volumes II and III cover two general categories of voice and data communications that serve international civil aviation. They are the **ground-ground communication** between points on the ground and the **air-ground communication** between aircraft and points on the ground. The air-ground communication provides aircraft with all necessary information to conduct flights in safety, using both voice and data. An important element of the ground-ground communication is the **aeronautical fixed telecommunications network (AFTN)**, a worldwide network organized to meet the specific requirements of international civil aviation. Within the AFTN category, all significant ground points, which include airports, air traffic control centers, meteorological offices and the like, are joined by appropriate links designed to serve aircraft throughout all phases of flight. Messages originated at any point on the network are routed as a matter of routine to all points required for the safe conduct of flight.

In Volume II of Annex 10, general, administrative and operational procedures pertaining to aeronautical fixed and mobile communications are presented.

Volume III of Annex 10 contains SARPs and guidance material for various air-ground and ground-ground voice and data communication systems, including **aeronautical telecommunication network (ATN)**, **aeronautical mobile-satellite service (AMSS)**, **secondary surveillance radar (SSR) Mode S air-ground data link**, **very high frequency (VHF) air ground digital link (VDL)**, **aeronautical fixed telecommunication network (AFTN)**, **aircraft addressing system**, **high frequency data link (HFDL)**, **aeronautical mobile service**, **selective calling system (SELCAL)**, **aeronautical speech circuits and emergency locator transmitter (ELT)**.

Volume IV of Annex 10 contains SARPs and guidance material for **secondary surveillance radar (SSR)** and **airborne collision avoidance systems (ACAS)**, including SARPs for SSR Mode A, Mode C and Mode S, and the technical characteristics of ACAS.

In Volume V of Annex 10, SARPs and guidance material on the utilization of aeronautical frequencies are defined. The **International Telecommunication Union (ITU)** has set up a framework in which the demands for radio spectrum from individual States are balanced with the interests of different radio service users to produce a planned radio environment incorporating interference-free, effective and efficient radio spectrum use. Volume V contains information on the assignment planning of individual aeronautical radio stations operating or planned to operate in different frequency bands.

## **Vocabulary**

Aeronautical Telecommunications – Авиационная электросвязь

communications – связь, сообщение

navigation – навигация

surveillance – наблюдение

volume – том

Radio Navigation Aids – радионавигационные средства

Communications Procedures – порядок ведения связи

Communication Systems – системы связи

Digital Data Communication System – система цифровой передачи связи

Voice Communication System – система голосовой передачи связи

Surveillance Radar – станция обнаружения

Collision Avoidance System – система избегания столкновений

Aeronautical Radio Frequency Spectrum Utilization – использование  
аэронавигационного радиочастотного спектра

Procedures for Air Navigation Services (PANS) – правила аэронавигационного  
обслуживания

technical document – технический документ

phases of flight – этапы полета

global navigation satellite system (GNSS) – глобальная навигационная  
спутниковая система

instrument landing system (ILS) – система посадки по приборам

microwave landing system (MLS) – микроволновая система обеспечения  
посадки

very high frequency (VHF) – очень высокая частота

omnidirectional radio range (VOR) – всенаправленный радиомаяк

non-directional radio beacon (NDB) – ненаправленный радиомаяк

distance measuring equipment (DME) – дальномерный радиомаяк

power requirements – требования по электропитанию

modulation - модуляция

signal characteristics – характеристики сигнала

monitoring – отслеживание

requisite degree of reliability – требуемый уровень надежности

ground-ground communication – передача данных «земля – земля»

air-ground communication – передача данных «воздух – земля»

aeronautical fixed telecommunications network (AFTN) – воздушная фиксированная сеть электросвязи

aeronautical telecommunication network (ATN) – сеть авиационной связи

aeronautical mobile-satellite service (AMSS) – авиационная служба спутниковых средств связи

secondary surveillance radar (SSR) – радар вторичного слежения

Mode S air-ground data link – передача данных «воздух – земля» в режиме S

ground digital link (VDL) – ОБЧ линии цифровой связи

aircraft addressing system – система адресов воздушных судов

high frequency data link (HFDDL) – высокочастотная линия передачи данных

aeronautical mobile service – авиационная мобильная служба

selective calling system (SELCAL) – система избирательного вызова

aeronautical speech circuits – цепи авиационной речевой связи

emergency locator transmitter (ELT) – аварийный приводной передатчик

secondary surveillance radar (SSR) – вторичный обзорный радиолокатор ВОРЛ

airborne collision avoidance systems (ACAS) – бортовая система предупреждения столкновений

International Telecommunication Union (ITU) – Международный союз электросвязи

Exercise 1. Please, answer the questions below. Comprehensive answers are welcome.

- What does this Annex provide?
- What does volume I specify?
- What types of communication can you name and who uses them?



- Why is Volume IV crucial for safety issues?
- What is ITU and what is its role?

Exercise 2. Please, fill in the blanks.

- Volume I \_\_\_ Annex 10 is a technical document \_\_\_ defines \_\_\_ international aircraft operations the systems necessary to provide radio navigation aids used \_\_\_ aircraft \_\_\_ all phases \_\_\_ flight.
- Volumes II \_\_\_ III cover two general categories \_\_\_ voice \_\_\_ data communications \_\_\_ serve international civil aviation. They are the ground-ground communication \_\_\_ points \_\_\_ the ground \_\_\_ the air-ground communication \_\_\_ aircraft \_\_\_ points \_\_\_ the ground.
- Messages originated \_\_\_ any point \_\_\_ the network are routed \_\_\_ a matter \_\_\_ routine \_\_\_ all points required \_\_\_ the safe conduct \_\_\_ flight.

Exercise 3. Please, provide synonyms from the text for the following words and expressions.

- Elements
- Guidance
- Surveillance
- To be originated
- To be routed

Exercise 4. Please, provide antonyms from the text for the following words and expressions.

- To include
- Necessary
- Appropriate
- General
- Mobile

Exercise 5. Please, compose five sentences with words and expressions from Vocabulary provided (in written).

## UNIT 5

### ANNEX 11 to the Convention on International Civil Aviation

#### Air Traffic Services

Control of air traffic was almost unknown in 1944. Today, air traffic control, **flight information** and **alerting services**, which together comprise air traffic services, rank high among the indispensable ground support facilities which ensure the safety and efficient operation of air traffic throughout the world. Annex 11 to the Chicago Convention defines air traffic services and specifies the worldwide Standards and Recommended Practices applicable in the provision of these services.

The world's airspace is divided into a series of **contiguous flight information regions (FIRs)** within which air traffic services are provided. In some cases, the flight information regions cover large oceanic areas with relatively low air traffic density, within which only flight information service and alerting service are provided. In other flight information regions, large portions of the airspace are controlled airspace within which air traffic control service is provided in addition to flight information and alerting services.

The prime objective of air traffic services, as defined in the Annex, is to prevent **collisions between aircraft**, whether taxiing on the maneuvering area, taking off, landing, en route or in the holding pattern at the destination aerodrome. The Annex also deals with ways of expediting and maintaining an orderly flow of air traffic and of providing advice and information for the safe and efficient conduct of flights and alerting service for **aircraft in distress**. To meet these objectives, ICAO provisions call for the establishment of flight information centers and air traffic control units. All aircraft fly in accordance with either instrument flight rules (IFR) or visual flight rules (VFR). Under IFR, the aircraft fly from one radio aid to the next or by reference to self-contained airborne navigation equipment

from which the pilot can determine the aircraft's position at all times. IFR flights are conducted through all but the **severest of weather conditions**, while aircraft flying under VFR must remain clear of cloud and operate in **visibility conditions** which will permit the pilot to see and avoid other aircraft.

Chapter 3 specifies the types of service to be provided to these flights - for example, IFR flights are provided with air traffic control service when operating in **controlled airspace**. When operating in **uncontrolled airspace**, flight information service, which includes known traffic information, is provided and the pilot is responsible for arranging the flight to avoid other traffic. Control service is normally not provided to VFR flights, unless in specific areas, in which case VFR flights are separated from IFR flights but no separation service is provided between VFR flights, unless specifically required by the ATC authority. However, not all aircraft are provided with air traffic services. If an aircraft is operating entirely outside of controlled airspace in an area where a flight plan is not required, the flight may not even be known to air traffic services.

Safety is the overriding concern of international civil aviation and air traffic management contributes substantially to safety in aviation. Annex 11 contains an important requirement for States to implement systematic and appropriate **air traffic services (ATS)** safety management programs to ensure that safety is maintained in the provision of ATS within airspaces and at aerodromes.

Safety management systems and programs will serve as an important contribution toward ensuring safety in international civil aviation. Air traffic control service consists of **clearances** and information issued by air traffic control units to achieve longitudinal, **vertical or lateral separation between aircraft**, in accordance with the provisions set out in Chapter 3 of the Annex. This chapter also deals with the contents of clearances, their coordination between ATC units and the coordination of **transfer of responsibility for control** as a flight progresses from the area of one control unit to another. An orderly transfer process requires that an aircraft must be under the control of only one air traffic control unit at any one time.

Air traffic control units are sometimes faced with a traffic **demand beyond the capacity** of a particular location or area, as occurs at busy aerodromes during peak periods.

Annex 11 provides for ATC units to specify restrictions to the traffic flow, when required, for the purpose of avoiding excessive delays to aircraft in flight. Annex 11 also specifies the requirements for coordination between the civil air traffic control units and **military authorities** or other agencies responsible for activities that may affect flights of civil aircraft. Military units are provided with flight plan and other data concerning flights of civil aircraft to assist in establishing identification in the event that a civil aircraft approaches or enters a restricted area.

Flight information service is provided to aircraft operating in controlled airspace and to others known to the air traffic services units.

The information includes **significant meteorological (SIGMET) information**, changes in the serviceability of navigation aids and in the condition of aerodromes and associated facilities and any other information likely to affect safety. IFR flights receive, in addition, information on weather conditions at departure, destination and alternate aerodromes, collision hazards to aircraft operating outside of control areas and control zones and, for flight over water, available information on **surface vessels**. VFR flights also receive information on weather conditions which would make visual flight impractical. Annex 11 also contains specifications for **operational flight information service (OFIS)** broadcasts, including **automated terminal information service (ATIS)** broadcasts.

Chapter 5 of Annex 11 is concerned with the alerting service, which provides for the alerting of **rescue coordination centers** when an aircraft is believed or known **to be in a state of emergency**, when it fails to communicate or to arrive on time or when information is received that a forced landing has been made or is imminent. Alerting service is automatically provided to all aircraft receiving air traffic control service and, as far as is practicable, to all other aircraft whose pilots have filed a flight plan or are otherwise known to air traffic services. It is also provided to aircraft known or believed to be subject to **unlawful interference**. The effect of the alerting service is to set in motion all appropriate rescue and emergency organizations which can provide assistance when and where required.

Subsequent chapters of the Annex cover ATS requirements for air-ground communications and for communications between ATS units and between those units and other essential offices. These chapters also specify the information required to be supplied to each type of air traffic services unit. Air-ground communications should permit direct, rapid and continuous static-free **two-way**

**radiotelephony communication**, whenever practicable, while those between ATS units should permit exchange of printed messages and, in the case of air traffic control units, direct voice communications between controllers. Because of the importance of the information transmitted over air-ground radio channels and that received from other units and offices, Annex 11 recommends that such communications should **be recorded**.

An Appendix to the Annex spells out the principles governing the identification of air traffic services routes to allow both pilots and ATS **to make unmistakable reference** to any route without resorting to geographical references. Another Appendix specifies the requirements for **designators** for significant points marked by a radio aid as well as those not marked by a radio aid. Annex 11 also contains a series of attachments with guidance material on a variety of subjects, from airspace organization to ATS requirements for air-ground channels to the establishment and naming of standard arrival and departure routes.

**Contingency planning** is an important responsibility of all States that provide air navigation services. An Attachment to Annex 11 contains concise guidance to assist States in providing for the safe and orderly flow of international air traffic in the event of disruptions of air traffic services and related supporting services and in preserving the availability of major world air routes in the event of disruptions. The sky may be limitless but not for air traffic. As more aircraft fill the crowded air routes, air traffic control concepts, procedures, equipment and rules will continue to evolve as will the provisions of this Annex.

## **Vocabulary**

flight information – полетная информация

alerting services – аварийные оповещения

contiguous flight information regions (FIRs) – смежные районы полетной информации

collisions between aircraft – столкновения воздушных судов

aircraft in distress – воздушное судно, терпящее бедствие

severest of weather conditions – сложнейшие метеоусловия

visibility conditions – условия видимости

controlled airspace – контролируемое воздушное пространство

uncontrolled airspace – неконтролируемое воздушное пространство

air traffic services (ATS) – обслуживание воздушного движения

clearance – разрешение

longitudinal, vertical or lateral separation between aircraft – продольное, вертикальное и боковое эшелонирование воздушных судов

transfer of responsibility for control – передача ответственности за управление

demand beyond the capacity – спрос, превышающий емкость (возможности)

military authorities – военные власти

significant meteorological (SIGMET) information – существенная метеорологическая информация

surface vessels – надводные суда

operational flight information service (OFIS) – оперативное полетно-информационное обслуживание

automated terminal information service (ATIS) – автоматическая передача информации в районе аэродрома

rescue coordination centers – координационные центры поиска и спасения

to be in a state of emergency – находиться в чрезвычайной ситуации

unlawful interference – незаконное вмешательство

two-way radiotelephony communication – двусторонняя радиотелефонная связь

to be recorded – записываться

to make unmistakable reference – делать точные (безошибочные) указания

designator – обозначение, указатель

contingency planning – планирование на случай непредвиденных обстоятельств

Exercise 1. Please, answer the questions below. Comprehensive answers are welcome.

- What does air traffic service comprise?
- Why is ATS important for flight safety?
- What role does ATS play for emergency situations?
- What is SIGMET and what is it used for?
- Why is ATS different from the one of 1944 and why is contingency planning so important?

Exercise 2. Please, fill in the blanks.

- Control service is normally not provided \_\_\_ VFR flights, \_\_\_ in specific areas, \_\_\_ which case VFR flights are separated \_\_\_ IFR flights \_\_\_ no separation service is provided \_\_\_ VFR flights, \_\_\_ specifically required \_\_\_ the ATC authority.
- Subsequent chapters \_\_\_ the Annex cover ATS requirements \_\_\_ air-ground communications and \_\_\_ communications \_\_\_ ATS units \_\_\_ between those units \_\_\_ other essential offices. These chapters \_\_\_ specify the information required to be supplied \_\_\_ each type \_\_\_ air traffic services unit.
- An Appendix \_\_\_ the Annex spells \_\_\_ the principles governing the identification \_\_\_ air traffic services routes to allow \_\_\_ pilots \_\_\_ ATS to make unmistakable reference \_\_\_ any route \_\_\_ resorting \_\_\_ geographical references.

Exercise 3. Please, provide synonyms from the text for the following words and expressions.

- To specify
- alerting service
- objective
- distress
- weather conditions

Exercise 4. Please, provide antonyms from the text for the following words and expressions.

- Controlled airspace
  - IFR
  - Surface vessel
  - To be in a state of emergency
  - To preserve

Exercise 5. Please, compose five sentences with words and expressions from Vocabulary provided (in written).

## UNIT 6

### ANNEX 12 to the Convention on International Civil Aviation

#### Search and Rescue

Search and rescue services are organized to respond to persons apparently in distress and in need of help. Prompted by the need to rapidly locate and rescue **survivors of aircraft accidents**, a set of internationally agreed Standards and Recommended Practices has been incorporated in ICAO's Annex 12 - Search and Rescue (SAR).

The Annex, which is complemented by a three-part Search and Rescue Manual dealing with SAR organization, management and procedures, sets forth the provisions for the establishment, maintenance and operation of search and rescue services by ICAO Contracting States in their territories and over the high seas. **Proposals** for Annex 12 were originally made in 1946. By 1951, the proposals had been reviewed and revised to meet international civil aviation requirements, and were embodied as Standards and Recommended Practices in the first edition of Annex 12.



Containing five chapters, the Annex details the organization and **cooperative principles** appropriate to effective SAR operations, outlines required necessary **preparatory measures** and sets forth proper operating procedures for SAR services in actual emergencies.

One of the first aspects addressed in the organizational chapter is the requirement for States to provide SAR services within their territories and over those portions of the high seas or areas of **undetermined sovereignty** as determined in regional air navigation agreements and approved by the Council of ICAO. This chapter also deals with the establishment of **mobile SAR units**, the means of communication for these units and the designation of other elements of public or private services suitable for search and rescue activity.

Provisions concerning equipment requirements of rescue units reflect the need to give adequate assistance at the scene of accidents, due regard being given to the number of passengers involved. Cooperation between the SAR services of neighboring States is essential to the efficient conduct of SAR operations. This important aspect is covered in depth in Chapter 3, which requires ICAO Contracting States to publish and disseminate all information needed for the expeditious entry into their territories of rescue units of other States. It is also recommended that persons qualified in the conduct of aircraft **accident investigation** accompany rescue units in order to facilitate accident investigation.

Chapter 4, which deals with preparatory measures, sets forth the requirements for **collation** and publication of information needed by SAR services. It specifies that detailed plans of operation must be prepared for the conduct of SAR operations and indicates the necessary information for inclusion in the plans.

Preparatory measures required to be undertaken by rescue units, **training requirements** and **removal of aircraft wreckage** are also covered. A search and rescue operation is a dynamic activity requiring uniformly comprehensive operating procedures that are sufficiently flexible to meet **extraordinary needs**. Beginning with the requirement to identify and categorize the emergency situation, Chapter 5 details action to be taken for each category of event.

Three distinct phases categorize emergency situations. The first is the "Uncertainty Phase" which is commonly declared when radio contact has been lost with an aircraft and cannot be re-established or when an aircraft fails to arrive at its destination. During this phase the Rescue Coordination Centre (RCC) concerned may be activated. The RCC collects and evaluates reports and data pertaining to the subject aircraft. Depending on the situation, the **uncertainty phase** may develop into an "**Alert Phase**", at which time the RCC alerts appropriate SAR units and initiates further action. The "**Distress Phase**" is declared when there is reasonable certainty that an aircraft is in distress. In this phase, the RCC is responsible for taking action to assist the aircraft and to determine its location as rapidly as possible. In compliance with a predetermined set of procedures, the aircraft operator, State of Registry, air traffic services units concerned, adjacent RCCs and appropriate accident investigation authorities are informed; a plan for the conduct of the search and rescue operation is drawn up and its execution is coordinated. Procedures are detailed in Chapter 5 for SAR operations involving two or more RCCs, for authorities in the field and for terminating or suspending SAR operations. Other procedures deal with actions to be taken at the scene of an accident and by a pilot-in-command intercepting a distress transmission.

An Appendix to the Annex provides three **sets of signals**, the first of which are signals for use by aircraft and surface craft during the conduct of a SAR operation. The second and third sets consist of ground-to-air visual signals for use by survivor and ground rescue units.

## **Vocabulary**

Search and Rescue (SAR) – поиск и спасание

survivors of aircraft accidents – выжившие в результате катастрофы

proposal – предложение

cooperative principles – принципы сотрудничества

preparatory measures – подготовительные меры

undetermined sovereignty – неопределенный суверенитет

mobile SAR unit – мобильное подразделение поисково-спасательной службы

accident investigation – расследование катастрофы

collation – сопоставление

training requirements – требования к подготовке

removal of aircraft wreckage – удаление обломков воздушного судна

extraordinary needs – потребности, возникающие в чрезвычайных обстоятельствах

uncertainty phase – стадия неопределенности

alert phase – стадия тревоги

distress phase – стадия бедствия

sets of signals – набор сигналов

Exercise 1. Please, answer the questions below. Comprehensive answers are welcome.

- What area search and rescue services needed for?
- Why should these services be provided promptly?
- Please name phases of an emergency situation.
- Why is investigation process so important?
- Which sets of signals do you know?

Exercise 2. Please, fill in the blanks.

- The Annex, \_\_\_ is complemented \_\_\_ a three-part Search \_\_\_ Rescue Manual dealing \_\_\_ SAR organization, management \_\_\_ procedures, sets \_\_\_ the provisions \_\_\_ the establishment, maintenance \_\_\_ operation \_\_\_ search \_\_\_ rescue services \_\_\_ ICAO Contracting States \_\_\_ their territories and \_\_\_ the high seas.

- One \_\_\_ the first aspects addressed \_\_\_ the organizational chapter is the requirement \_\_\_ States to provide SAR services \_\_\_ their territories \_\_\_ over those portions \_\_\_ the high seas \_\_\_ areas \_\_\_ undetermined sovereignty \_\_\_ determined \_\_\_ regional air navigation agreements and approved \_\_\_ the Council of ICAO.

- Depending \_\_\_ the situation, the uncertainty phase may develop \_\_\_ an "Alert Phase", \_\_\_ which time the RCC alerts appropriate SAR units \_\_\_ initiates further action.

Exercise 3. Please, provide synonyms from the text for the following words and expressions.

- To respond
- Prompt
- Proposal
- High seas
- Designation

Exercise 4. Please, provide antonyms from the text for the following words and expressions.

- To set forth
- Necessary
- High seas
- undetermined sovereignty
- Expeditious

Exercise 5. Please, compose five sentences with words and expressions from Vocabulary provided (in written).

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