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AVIATION MAINTENANCE TECHNICIAN CERTIFICATION SERIES

CAT-A

10

AVIATION LEGISLATION

COMPLIANT WITH EASA

EASA PART 66/147

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EASA PART 66/147

EASA 2023-989 COMPLIANT

The publishers of this Aviation Maintenance Technician Certification Series welcome you to the world of aviation maintenance. For additional educational tools created to prepare candidates for licensure, contact Aircraft Technical Book Company. We wish you good luck and success in your studies and in your aviation career!

Special thanks to our instructors, contributors, and authors
Contributor - Mladen Hanževacki
Contributor - Dario Simunovic

Layout and Design by Michael Amrine

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REVISION LOG

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VERSION	EFFECTIVE DATE	DESCRIPTION OF REVISION(S)
001	2016.01	Module creation and release.
002	2020.10	Enhanced or modified content within the following Submodules: Submodule 4: Complete rewrite for updated regulations. Submodule 6: Complete rewrite for updated regulations.
002.1	2023.04	Inclusion of Measurement Standards for clarification, page iv. Minor appearance and format updates.
003	2024.06	Regulatory update for EASA 2023-989 compliance.
003.1	2025.05	Complete rewrite of Submodule 10, improved and removed figures throughout.

Module was reorganized based upon the EASA 2023-989 subject criteria. Enhancements included in this version 003.1 are:

10.1 *Regulatory Framework* - Added the relationship between regulations (hard law) and AMC, GM and CSS (soft law).
10.1 *Regulatory Framework* - Added occurrence reporting EU 376/2014.
10.1 *Regulatory Framework* - Added relationship between the annexes.
10.3 *Approved Maintenance Organisations* - Added Combined Airworthiness Organizations
10.5 *Air Operations* - Added topic.
10.10 *Cybersecurity in Aviation Maintenance* - Complete rewrite.
Replaced all questions and answers.

MEASUREMENT STANDARDS

SI Units
The measurements used in this book are presented with the International System of Units (SI) standards in all cases except when otherwise specified by ICAO (for example, altitude expressed in feet or performance numbers as specified by a manufacturer). The chart below can be used should your studies call for conversions into imperial numbers.

Number Groups
This book uses the International Civil Aviation Organization (ICAO) standard of writing numbers. This method separates groups of 3 digits with a space, versus the European method by periods and the American method by commas.

For example, the number one million is expressed as:

ICAO Standard	1 000 000
European Standard	1.000.000
American Standard	1,000,000

Prefixes
The prefixes used in the table below form names of the decimal equivalents in SI units.

PREFIX AND SYMBOLS CHART

MULTIPLICATION FACTORS	PREFIX	SYMBOL
1 000 000 000 000 000 000 = 10^{18}	exa	E
1 000 000 000 000 000 = 10^{15}	peta	P
1 000 000 000 000 = 10^{12}	tera	T
1 000 000 000 = 10^{9}	giga	G
1 000 000 = 10^{6}	mega	M
1 000 = 10^{3}	kilo	k
100 = 10^{2}	hecto	h
10 = 10^{1}	deca	da
0.1 = 10^{-1}	deci	d
0.01 = 10^{-2}	centi	c
0.001 = 10^{-3}	milli	m
0.000 001 = 10^{-6}	micro	μ
0.000 000 001 = 10^{-9}	nano	n
0.000 000 000 001 = 10^{-12}	pico	p
0.000 000 000 000 001 = 10^{-15}	femto	f
0.000 000 000 000 000 001 = 10^{-18}	atto	a

COMMON CONVERSIONS CHART

IMPERIAL	TO	SI (METRIC)
Distance		
1 Inch	is equal to	2.54 Centimeters
1 Foot	is equal to	0.304 Meters
1 (Statute) Mile	is equal to	1.609 Kilometers
Weight		
1 Pound	is equal to	0.454 Kilograms
Volume		
1 Quart	is equal to	0.946 Liters
1 Gallon	is equal to	3.785 Liters
Temperature		
°0 Fahrenheit	is equal to	-17.778 Celsius (°C)
°0 Fahrenheit	is equal to	273.15 Kelvin (K)
Area		
1 Square Inch	is equal to	6.451 Square Centimeters
1 Square Foot	is equal to	0.093 Square Meters
1 Square Mile	is equal to	2.59 Square Kilometers
Velocity		
1 Foot Per Second	is equal to	0.304 Meters Per Second
1 Mile Per Hour	is equal to	1.609 Kilometers Per Hour
1 Knot	is equal to	1.852 Kilometers Per Hour

SI (METRIC)	TO	IMPERIAL
Distance		
1 Centimeter	is equal to	0.394 Inches
1 Meter	is equal to	3.28 Feet
1 Kilometer	is equal to	0.621 Miles
Weight		
1 Kilogram	is equal to	2.204 Pounds
Volume		
1 Liter	is equal to	1.057 Quarts
1 Liter	is equal to	0.264 Gallons
Temperature		
°0 Celsius (°C)	is equal to	32° Fahrenheit
°0 Kelvin (K)	is equal to	-459.67 Fahrenheit
Area		
1 Square Centimeter	is equal to	0.155 Square Inches
1 Square Meter	is equal to	10.764 Square Feet
1 Square Kilometer	is equal to	0.386 Square Miles
Velocity		
1 Meter Per Second	is equal to	3.281 Feet Per Second
1 Kilometer Per Hour	is equal to	0.621 Miles Per Hour
1 Kilometer Per Hour	is equal to	0.540 Knots

Pressure		
pounds per square inch (psi)	kiloPascals (kPa)	6.897
pounds per square inch (psi)	Pascals (Pa)	6.894

BASIC KNOWLEDGE REQUIREMENTS

Qualification on basic subjects for each aircraft maintenance license category or subcategory is accomplished in accordance with the following matrix. Where applicable, subjects are indicated by an "**X**" in the column below the license heading.

EASA LICENSE CATEGORY CHART MODULE NUMBER AND TITLE		A1 Airplane Turbine	B1.1 Airplane Turbine	B1.2 Airplane Piston	B1.3 Helicopter Turbine	B1.4 Helicopter Piston	B2 Avionics
1	Mathematics	X	X	X	X	X	X
2	Physics	X	X	X	X	X	X
3	Electrical Fundamentals	X	X	X	X	X	X
4	Electronic Fundamentals		X	X	X	X	X
5	Digital Techniques, Electronic Instrument Systems	X	X	X	X	X	X
6	Materials and Hardware	X	X	X	X	X	X
7	Maintenance Practices	X	X	X	X	X	X
8	Basic Aerodynamics	X	X	X	X	X	X
9	Human Factors	X	X	X	X	X	X
10	Aviation Legislation	X	X	X	X	X	X
11	Aeroplane Aerodynamics, Structures and Systems	X	X				
12	Rotorcraft Aerodynamics, Structures and Systems				X	X	
13	Aircraft Aerodynamics, Structures and Systems						X
14	Propulsion						X
15	Gas Turbine Engine	X	X		X		
16	Piston Engine			X		X	
17	Propeller	X	X	X			

Basic knowledge requirments as outlined in Part-66, Appendix I

The knowledge level indicators are defined on 3 levels as follows:

Level 1

A familiarization with the principal elements of the subject.

Objectives:

a. The applicant should be familiar with the basic elements of the subject.
b. The applicant should be able to give a simple description of the whole subject, using common words and examples.
c. The applicant should be able to use typical terms.

Level 2

A general knowledge of the theoretical and practical aspects of the subject and an ability to apply that knowledge.

Objectives:

a. The applicant should be able to understand the theoretical fundamentals of the subject.
b. The applicant should be able to give a general description of the subject using, as appropriate, typical examples.
c. The applicant should be able to use mathematical formula in conjunction with physical laws describing the subject.
d. The applicant should be able to read and understand sketches, drawings and schematics describing the subject.
e. The applicant should be able to apply his knowledge in a practical manner using detailed procedures.

Level 3

A detailed knowledge of the theoretical and practical aspects of the subject and a capacity to combine and apply the separate elements of knowledge in a logical and comprehensive manner.

Objectives:

a. The applicant should know the theory of the subject and interrelationships with other subjects.
b. The applicant should be able to give a detailed description of the subject using theoretical fundamentals and specific examples.
c. The applicant should understand and be able to use mathematical formula related to the subject.
d. The applicant should be able to read, understand and prepare sketches, simple drawings and schematics describing the subject.
e. The applicant should be able to apply his knowledge in a practical manner using manufacturer's instructions.
f. The applicant should be able to interpret results from various sources and measurements and apply corrective action where appropriate.

PART 66 BASIC KNOWLEDGE REQUIREMENTS

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		A1
10.1	**Regulatory Framework** Role of: — The International Civil Aviation Organization (ICAO); — The European Commission (EC); — The European Union Aviation Safety Agency (EASA); — The European Union Member States and national aviation authorities; — The bilateral agreements concluded by the European Commission; — Regulation (EU) 2018/1139 (the Basic Regulation) and its implementing acts: Regulations (EU) No 748/2012 (Initial Airworthiness) and (EU) No 1321/2014 (Continuing Airworthiness); — The relationship between regulations (hard law) and AMC, GM and CSs (soft law); — Occurrence reporting according to Regulation (EU) No 376/2014; — The relationship between the various annexes (parts) relating to Initial and Continuing Airworthiness (such as Part 21, Part-M, Part-145, Part-66, Part-147, Part-T, Part-ML, Part-CAMO, and Part-CAO) and Regulations (EU) No 965/2012 (the Air Operations Regulation) and (EU) No 1178/2011 (the Air Crew Regulation).	1
10.2	**Certifying Staff — Maintenance** Deep understanding of Part-66 maintenance licences with the associated privileges and authorisations, and how to exercise them properly for the different aircraft categories.	2
10.3	**Approved Maintenance Organizations** General understanding of Part-145 and Part-CAO.	2
10.4	**Independent Certifying Staff** Privileges, responsibilities, record-keeping, limitations, and oversight according to Part-M, Part-66 and Part-ML.	-
10.5	**Air Operations** General understanding of Regulation (EU) No 965/2012 (the Air Operations Regulation); Differences between commercial and non-commercial air operations, and their influence on aircraft maintenance; Air Operator Certificates (AOCs) and self-declaration authorisations; Air operator responsibilities, in particular regarding continuing airworthiness and maintenance; Specialized operations/specific approvals: ETOPS, CAT I/II/III, and BRNAV. Minimum Equipment List (MEL) and Configuration Deviation List (CDL); Aircraft placarding and markings; Documents to be carried on board: — Certificate of Airworthiness/Restricted Certificate of Airworthiness; — Airworthiness Review Certificate; — Permit to Fly; — Certificate of Registration; — Noise Certificate; — Weight and Balance report; — Radio Station Licence.	1
10.6	**Certification of Aircraft, Parts, and Appliances** Basic understanding of Part 21 and of the following EASA certification specifications: CS-22, CS-23, CS-25, CS-27, CS-29, and CS-STAN.	2
10.7	**Continuing Airworthiness** General understanding of the Part 21 requirements on continuing airworthiness; General understanding of Part-M, Part-ML and Part-CAMO; Aircraft Maintenance Programme.	2
10.8	**Oversight principles in Continuing Airworthiness**	1
10.9	**Maintenance and Certification beyond current EU Regulations (if not superseded by EU requirements)** Maintenance of European Union aircraft that are not within the scope of Regulation (EU) 2018/1139 (Annex I aircraft); European military airworthiness requirement (EMAR) 66 licence; Applicable national and international requirements for component maintenance, welding, painting, NDT, etc., (if not superseded by EU requirements).	-
10.10	**Cybersecurity in Aviation Maintenance** Regulation on the introduction of organisation requirements for the management of information security risks related to aeronautical information systems used in civil aviation.	1

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Regulatory Framework

Submodule 1

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		A1
10.1	**Regulatory Framework** Role of: — The International Civil Aviation Organization (ICAO); — The European Commission (EC); — The European Union Aviation Safety Agency (EASA); — The European Union Member States and national aviation authorities; — The bilateral agreements concluded by the European Commission; — Regulation (EU) 2018/1139 (the Basic Regulation) and its implementing acts: Regulations (EU) No 748/2012 (Initial Airworthiness) and (EU) No 1321/2014 (Continuing Airworthiness); — The relationship between regulations (hard law) and AMC, GM and CSs (soft law); — Occurrence reporting according to Regulation (EU) No 376/2014; — The relationship between the various annexes (parts) relating to Initial and Continuing Airworthiness (such as Part 21, Part-M, Part-145, Part-66, Part-147, Part-T, Part-ML, Part-CAMO, and Part-CAO) and Regulations (EU) No 965/2012 (the Air Operations Regulation) and (EU) No 1178/2011 (the Air Crew Regulation).	1

10.1 REGULATORY FRAMEWORK

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO)

ICAO is a specialized agency of the United Nations (UN) created through the Chicago Convention on International Civil Aviation signed on the 7th of December 1944. Its headquarters are located in Montreal. [**Figure 1-1**]

Figure 1-1. ICAO headquarters in Montreal, Canada.

ICAO works with the Convention's 192 member states and industry groups to reach consensus on international civil aviation standards and recommended practices (SARPs) and policies in support of a safe, efficient, secure, economically sustainable and environmentally responsible civil aviation sector. These SARPs and policies are used by ICAO member states to ensure that their local civil aviation operations and regulations conform to global norms, which in turn permits more than 100 000 daily flights in aviation's global network to operate safely and reliably in every region of the world.

In addition to its work resolving consensus driven international SARPs and policies among its member states and industry, and among many other priorities and programs, ICAO also coordinates assistance and capacity building for States in support of numerous aviation development objectives; produces global plans to coordinate multilateral strategic progress for safety and air navigation; monitors and reports on numerous air transport sector performance metrics; and audits state's civil aviation oversight capabilities in the areas of safety and security.

On 1 November 1944, representatives from 54 nations met in Chicago to establish a framework to regulate the development of worldwide civil aviation. 52 countries signed the Chicago Convention. It had to be ratified by 26 states to come into force. As an interim, an international aviation intermediate agreement was adopted. This gave birth to the Provisional International Civil Aviation Organization (PICAO) charged with follow up work for the fledgling organization.

PICAO functioned as a provisional organization until the 4th of April 1947. ICAO as it is known today was born after the 26th state ratified the Chicago Convention. In October 1947, ICAO became a specialized United Nations agency linked to the Economic and Social Council of the U.N. Today, ICAO consists of 190 signatory states, of which only three are not members.

THE CHICAGO CONVENTION

The Chicago Convention defines the rights and obligations of the signatory states regarding the operation of aircraft. After working for five weeks on the problems effecting international civil aviation, the representatives of 52 States present established a new convention. The goals of this convention related to international civil aviation were cited in the preamble as follows:

- WHEREAS the future development of international civil aviation can greatly help to create and preserve friendship and understanding among the nations and peoples of the world, yet its abuse can become a threat to the general security.
- WHEREAS it is desirable to avoid friction and to promote that cooperation between nations and peoples upon which the peace of the world depends.
- THEREFORE, the undersigned governments having agreed on certain principles and arrangements in order that international civil aviation may be developed in a safe and orderly manner and that international air transport services may be established on the basis of equality of opportunity and operated soundly and economically have accordingly concluded this convention to that end.

During the course of five weeks, the conference produced six important documents:

1. The Convention on International Civil Aviation. (The Chicago Convention)
2. The Interim Agreement on International Civil Aviation (PICAO).
3. The International Air Services Transit Agreement or "Two Freedom" agreement.
4. The International Air Transport Agreement or "Fifth Freedom" agreement.
5. The drafts of twelve technical annexes.
6. A standard form of bilateral agreement for the exchange of routes and air services.

SECOND FREEDOM AGREEMENT

The International Air Services Transit Agreement or "Two Freedom" agreement is an agreement under which the aircraft of member states may fly over each other's territory. This particular document was a great step forward in the path of international air transport development over a large part of the world.

FIFTH FREEDOM AGREEMENT

Another important document/agreement developed was the Fifth Freedom Agreement. It states that each member state grants to other member states:

- The "Second Freedom" agreed rights.
- The right to offload passengers/freight uploaded in the country of origin of the aircraft.
- The right to upload passengers/freight destined for the country of origin of the aircraft.
- The right to upload/offload passengers destined or coming from any member state.

ICAO GOALS AND OBJECTIVES

ICAO's aims and objectives are to draw up the principles and techniques of international air navigation and to promote the planning and development of international air transport to:

- Foster the planning and development of international air transport to ensure the safe and orderly growth of international civil aviation throughout the world.
- Encourage the arts of aircraft design and operation for peaceful purposes.
- Encourage the development of airways, airports, and air navigation facilities for international civil aviation.
- Meet the needs of the peoples of the world for safe, regular, efficient, and economical air transport;
- Prevent economic waste caused by unreasonable competition.
- Ensure that the rights of contracting states are fully respected and that every contracting state has a fair opportunity to operate international airlines.
- Avoid discrimination between contracting states.
- Promote safety of flight in international air navigation.
- Generally promote the development of all aspects of international civil aeronautics.

ICAO STRATEGIC OBJECTIVES

In its ongoing mission to support and enable the global air transport network that meets or surpasses the social and economic development and broader connectivity needs of global businesses and passengers, and acknowledging the clear need to anticipate and manage the projected doubling of global air transport capacity by 2030 without unnecessary adverse impacts on system safety, efficiency, convenience or environmental performance, ICAO has established five comprehensive strategic objectives:

- *Safety*—Enhance global civil aviation safety. This strategic objective is focused primarily on the state's regulatory oversight capabilities. The Global Aviation Safety Plan outlines the key activities for the triennium.
- *Air Navigation Capacity and Efficiency*—Increase the capacity and improve the efficiency of the global civil aviation system. Although functionally and organizationally interdependent with safety, this strategic objective is focused primarily on upgrading the air navigation and aerodrome infrastructure and developing new procedures to optimize aviation system performance. The Global Air Navigation Capacity and Efficiency Plan (Global Plan) outlines the key activities for the triennium.
- *Security and Facilitation*—Enhance global civil aviation security and facilitation. This strategic objective reflects the need for ICAO's leadership in aviation security, facilitation and related border security matters.
- *Economic Development of Air Transport*—Foster the development of a sound and economically viable civil aviation system. This strategic objective reflects the need for ICAO's leadership in harmonizing the air transport framework focused on economic policies and supporting activities.
- *Environmental Protection*—Minimize the adverse environmental effects of civil aviation activities. This strategic objective fosters ICAO's leadership in all aviation related environmental activities and is consistent with the ICAO and UN system environmental protection policies and practices.

ICAO COMPOSITION AND CONCERNS

According to the terms of the Convention, the Organization is made up of an Assembly, a Council of limited membership with various subordinate bodies and a Secretariat. The chief officers are the President of the Council and the Secretary General.

The Assembly, composed of representatives from all contracting states, is the sovereign body of ICAO. It meets every three years. The assembly reviews in detail the work of the organization and sets policy for the coming years. It also votes a triennial budget.

The Council is a governing body elected by the Assembly for a three year term. It is composed of 36 states. The assembly chooses the council member states from three categories: states of chief importance in air transport, states which make the largest contribution to the provision of facilities for air navigation and states whose designation will ensure that all major areas of the world are represented. As the governing body, the Council gives continuing direction to the work of ICAO. It is in the Council that Standards and Recommended Practices are adopted and incorporated as Annexes to the Convention on International Civil Aviation. The council is assisted by the Air Navigation Commission (technical matters), the Air Transport Committee (economic matters), the Committee on Joint Support of Air Navigation Services and the Finance Committee.

The Secretariat, headed by a Secretary General, is divided into five main divisions: The Air Navigation Bureau, the Air Transport Bureau, the Technical Cooperation Bureau, the Legal Bureau, and the Bureau of Administration and Services. In order that the work of the Secretariat shall reflect a truly international approach, professional personnel are recruited on a broad geographical basis.

ICAO works in close cooperation with the other members of the United Nations family such as the World Meteorological Organization, the International Telecommunication Union, the Universal Postal Union, the World Health Organization and the International Maritime Organization. Non-governmental organizations which also participate in ICAO's work include the International Air Transport Association, the Airports Council International, the International Federation of Air Line Pilot's Associations, and the International Council of Aircraft Owner and Pilot Associations.

The breadth of ICAO concerns include standardization in such areas as communication, navigation, and surveillance of aircraft as well as air traffic control management. It has established nine regions for setting up installations and services such as airports, navigational aids, weather stations, communications, etc. Facilities standards, customs formalities and public health are also issues for ICAO. In analyzes economic and legal question of concern to the international aviation community such as avoiding total deregulation and setting international law. ICAO is also involved in technical cooperation for development by communicating international data for the identification of future challenges in international aviation.

TECHNICAL ANNEXES

The ICAO Council has elaborated and adopted 18 technical annexes concerning the following aspects of international aviation:

- Annex 1: Personnel Licensing
- Annex 2: Rules of the Air
- Annex 3: Meteorological Service for International Air Navigation
- Annex 4: Aeronautical Charts
- Annex 5: Units of Measurement to be Used in Air and Ground Operations
- Annex 6: Operation of Aircraft
- Annex 7: Aircraft Nationality and Registration Marks
- Annex 8: Airworthiness of Aircraft
- Annex 9: Facilitation
- Annex 10: Aeronautical Telecommunications
- Annex 11: Air Traffic Services
- Annex 12: Search and Rescue
- Annex 13: Aircraft Accident and Incident Investigation
- Annex 14: Aerodromes
- Annex 15: Aeronautical Information Services
- Annex 16: Environmental Protection
- Annex 17: Security: Safeguarding International Civil Aviation Against Acts of Unlawful Interference
- Annex 18: Safe Transport of Dangerous Goods by Air
- Annex 19: Safety Management

ANNEX 1 – PERSONNEL LICENSING

Particular concern to maintenance personnel is Annex 1 entitled Personnel Licensing. It contains standards and recommended practices adopted by the ICAO as the minimum standards for personnel licensing regarding training and issuance of licenses and ratings as well as medical standards for pilots, flight crew, aircraft maintenance technicians, air traffic controllers, flight dispatchers, aeronautical station operators, and aeronautical meteorological personnel.

In its appendices, Annex 1 defines the requirements for proficiency in languages used for radiotelephony communications for pilots and air traffic controllers, requirements for approved training organizations, requirements for the issue of the multi crew pilot licenses and the framework for safety management systems.

ANNEX 6 – OPERATION OF AIRCRAFT

The main objective of this Annex is to standardize, as much as possible, the operation of international air transport aircraft to ensure the best safety and efficiency of service. It is divided into three parts:

- Part 1: Aircraft involved in international commercial air transport.
- Part 2: Aircraft involved in international general aviation.
- Part 3: International helicopter flights.

The general purpose of Annex 6 is to contribute to the safety of international air navigation by providing criteria for safe operating practices, and to contribute to the efficiency and regularity of international air navigation by encouraging ICAO's contracting states to facilitate the passage over their territories of commercial aircraft belonging to other countries that operate in conformity with these criteria.

ANNEX 8 – AIRWORTHINESS OF AIRCRAFT

This Annex is of importance to technicians in that it deals with the principles that, in the interest of the 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.

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.

Annex 8 is divided into four parts:

1. Part I: Definitions.
2. Part II: Procedures for certification and continuing airworthiness of aircraft.
3. Part III: Technical requirements for the certification of new large aeroplane designs.
4. Part IV: Helicopters.

ANNEX 10 – AERONAUTICAL TELECOMMUNICATIONS

Aeronautical telecommunication agreement and cooperation is required for successful international aviation operations. Annex 10 deals with issues related to aeronautical telecommunications. It subdivides this subject matter and addresses specific issues in a series of volumes as follows:

Volume 1: Radio Navigation Aids
Volume 2: Communications Procedures
Volume 3: Communications Systems
Volume 4: Surveillance Radar and Collision Avoidance System
Volume 5: Aeronautical Radio Frequency Spectrum Utilization

EUROPEAN UNION INSTITUTIONS

Figure 1-2 shows the EU institutions and their interdependence in terms of aviation safety.

THE ROLE OF THE EUROPEAN COMMISSION

The European Commission is one of the institutions of the European Union (EU). [**Figure 1-3**] It is independent of the individual EU states and holds great powers. The European Commission represents and defends the European Union as a whole entity. It presents legislative proposals and oversees the application of policies and implementation of the EU budget.

The main roles of the European Commission are:

a. Proposing new legislation - The commission is the sole EU institution tabling laws for adoption by the parliament and the council that:
   - Protect the interests of the EU and its citizens on issues that can't be dealt with effectively at national level.
   - Get technical details right by consulting experts and the public.

b. Implementing EU policies and the budget:
   - Sets EU spending priorities, together with the council and parliament.
   - Draws up annual budgets for approval by the council and parliament.
   - Supervises how the money is spent, under scrutiny by the court of auditors.

c. Enforcing European law:
   - Together with the Court of Justice, ensures that EU law is properly applied in all the member countries.

d. Representing the EU on the international stage:
   - Speaks on behalf of all EU countries in international bodies, in particular in areas of trade policy and humanitarian aid.
   - Negotiates international agreements for the EU.

Figure 1-2. EU institutions.

Figure 1-3. European Commission headquarters in Brussels, Belgium.


Figure 1-4. European Parliament in Strasbourg, France.

The European Commission's activities in civil aviation fall within the responsibility of the Directorate General for Transport and the Environment. Specifically, within the organization of the Directorate of Air Transport, Unit F2 is responsible for single European sky & modernization of air traffic control. Unit F3 deals with air safety and Unit F4 is responsible for infrastructures and airports.

Since, 1 November 2004, the European Commission has a commissioner for each member state. The commission has a president, a vice president, who is also the representative for foreign affairs and safety policy, and 25 members each in charge of an individual area of concern (for example, regional policy, business, action on climate, etc.) In November of 2014, the number of commissioners was reduced to two thirds of the number of member states.

The members of the Commission are chosen from member state nationals following a fair rotation system between member countries. The Commission is responsible to the European Union parliament.

The Commission is assisted by a secretary general who prepares the work and ensures coordination between its branches and other institutions. The length of mandate of the Commission is five years as is the term of office of the European parliament. The commission meets at least once a week in Brussels and during the monthly sessions of the European Parliament in Strasbourg. [**Figure 1-4**]

The European Commission promotes the general interests of the EU and takes appropriate initiatives to that end. It ensures external representation of the EU with international organizations in most areas. The EC also provides delegations to third countries (non EU states). European Commission responsibilities include:

1. Initiation of Legislative Power - most of the legislative acts of the Council (Council of Ministers of the European Union) require a proposal for such action from the Commission. The Council cannot amend a proposal without a unanimous ruling. The Commission can modify the proposal as long as the council has not ruled on it.
2. Guardianship of Treaties - the Commission ensures compliance with and enforcement of European law and secondary legislation (regulations, directives, decisions, etc.) under the control of the Court of Justice of the European Union. It inquires, prevents and penalizes members for non-compliance with European treaties. It can appeal to the Court of Justice of the European Union if a state does not follow the opinion that the European Commission has previously sent.
3. Execution Power - the Commission is the body that executes policies and measures adopted by the Council of Ministers of the European Union. It administers the budget and manages common policies and funding. The Council monitors EC activities through various committees.

EUROPEAN UNION AVIATION SAFETY SYSTEM

The objective of the European Aviation Safety Program is to ensure that the system for the management of aviation safety in the European Union delivers a safety performance that is the best of any world region, uniformly enjoyed across the whole Union, and continuing to improve over time. In doing so the EU will use, as a measurement of success, the rate of fatal accidents per 10 million flights per world region.

The strategy for aviation safety in the EU for the coming years was established by the European Commission in a Communication to the Council and the European Parliament called Setting up an Aviation Safety Management System for Europe.

In order to further improve the already excellent safety record that exists in the civil aviation industry, ICAO has promoted the principles of safety management. These principles revolve around the implementation of a safety management system in industry organizations and a State Safety Program (SSP) in contracting states.

The sharing of roles between the EU and the member states, as described in the EASA Basic Regulation, makes it necessary for the member states to work together with EASA to fully implement the SSP. Production of an EU equivalent of an SSP, an European Aviation Safety Program, is a more efficient means of discharging this obligation and would support the EU Members and associated states in developing their own SSPs.

The key players and their role in the European Union Aviation Safety System are shown in **Figure 1-5**.

Figure 1-5. EU Aviation Safety System.

EUROPEAN UNION AVIATION SAFETY AGENCY (EASA)

The European Aviation Safety Agency (EASA or the Agency) is the centerpiece of the European Union's strategy for aviation safety. Its mission is to promote and achieve the highest common standards of safety and environmental protection in civil aviation. EASA is the agency of the EU that looks after flight safety. It is based in Cologne, Germany and became operational in September 2003. The agency employs over 800 aviation experts and administrators from all European Union countries. [**Figure 1-6**]

EASA gathers 32 member states, 28 of them being European Union states and the remaining 4 are EFTA states (Switzerland, Norway, Iceland, and Lichtenstein). It has four permanent international representations:

- Washington (USA)
- Montreal (Canada)
- Beijing (China)
- Singapore

The creation of EASA paved the way for a new EU legislation on safety and the environmental compatibility of civil aviation. EASA was established in 2002 by Regulation EC 1592/2002 (repealed by Regulation EC 216/2008) of the European Parliament and the Council in order to ensure a high and uniform level of safety in civil aviation, by the implementation of common safety rules and measures. The new Basic Regulation EU 2018/1139 entered into force on 22 August 2018 and sets out the tasks of the Agency. In addition to the tasks previously established, the basic regulation formalizes EASA's role in the domain of drones and urban air mobility, enabling the Agency to prepare rules for all sizes of civil drones and harmonize standards for the commercial market across Europe. The regulation enlarges the Agency's role in areas such as in environmental protection, research and development, or international cooperation. The new mandate also gives EASA a coordinating role in cyber security in aviation.

EASA's mission is to promote the highest possible level of safety and environmental protection in civil aviation. It facilitates the free movement of goods, persons and services, promotes cases for regulatory and certification processes and assists member states

Figure 1-6. EASA headquarters in Cologne, Germany.

in meeting their obligations under ICAO. At the global level, EASA promotes and defends its views on the safety standards to be applied in civil aviation.

EASA RESPONSIBILITIES

At first, EU regulations merely established EASA on the basis for action in the field of certification of aeronautical products, organizations and persons involved in the design, production and maintenance of aircraft. EASA has taken over the responsibilities of the former Joint Aviation Authorities system which ceased on 30 June 2009. The agency's responsibilities are being acquired progressively. In 2008, through the implementation of a new EASA Regulation EC 216/2008, EASA's role was extended beyond its previous scope to cover flight operations and flight crew licensing.

In Autumn 2009, as part of an aviation package also including the second package of measures for Single European Sky, the European Community adopted Regulation EC 1108/2009 amending Regulation EC 216/2008 and extending EASA's remit to encompass the field of aerodromes, air traffic management and air navigation services. As previously, however, aircraft used for military, customs and police services, and persons and organizations involved in such activities, remain outside the remit of EASA.

EASA has currently the following responsibilities:

- Draft implementing rules in all fields pertinent to the EASA mission and provide technical expertise to the EU.
- Certify & approve products and organizations, in fields where EASA has exclusive competence (e.g. airworthiness).
- Provide oversight and support to member states in fields where EASA has shared competence (e.g. air operations, air traffic management).
- Promote the use of European and worldwide standards.
- Cooperate with international actors in order to achieve the highest safety level for EU citizens globally (e.g. EU safety list, third country operators authorizations).
- Perform safety research and analysis including publication of an annual safety review.

The Agency may adopt various types of acts. [**Figure 1-7**] It may:

- Take binding individual decisions by granting aircraft type certificates and by conducting inspections and investigations.
- Issue non-binding documents containing certification specifications (CS), acceptable means of compliance (AMC) and guidance material (GM) (for use in the certification process) and present opinions to the European Commission on the essential requirements and implementing rules to be adopted.

The Agency also has the power to conduct certain tasks for which collective action is more effective than action by individual member states. In particular, EASA is responsible for the certification of aeronautical products. It also helps the Commission monitor the implementation of rules and safeguards that may be required. EASA provides technical assistance to aeronautical authorities of third countries and international organizations for safety and environmental compatibility of civil aviation. Finally, the Agency supports the European Union and its member states in their cooperation with and assistance to third countries. [**Figure 1-8**]

INDEPENDENCE AND SUPERVISION

To protect from political interference, decisions of safety must be undertaken by a neutral and independent authority with the necessary skills. EASA and its Executive Director are under the supervision of an independent management board of the Agency, which is responsible for the definition of the Agency's priorities, the establishment of the budget and for monitoring the Agency's operation. It adopts EASA annual report and work program (after approval by the European Commission) and the working procedures to be followed by the Agency. The executive director is appointed by the management board that is composed of representatives from member states and one representative of the commission. The EASA advisory board assists the management board in its work. It comprises of organizations that represent the aviation personnel, manufacturers, commercial and general aviation operators, maintenance industry, training organizations and air sports. [**Figure 1-9**] The Agency's budget is financed by a contribution from the European Community, fees paid for certificates issued by the Agency and charges for publications and training provided by the Agency.

WORKING METHODS

The Agency applies transparent procedures for the adoption of opinions, acceptable means of compliance and guidance material. These procedures ensure the use of the relevant expertise, wide consultation of all interested parties and the right of each member state to be associated with the adoption process. Special procedures allow the Agency to take immediate action in case of safety problems. Similar transparent procedures apply in the case of individual decisions.

The Agency and the qualified entities acting on its behalf may undertake the inspections and investigations necessary in order to perform the tasks assigned to them. The Agency conducts inspections in the member states to verify that safety regulations and the implementing rules are applied correctly at national level.

EASA is authorized to conduct the investigations required in order to issue the relevant certificates and ensure continued safety oversight.

STUDIES AND RESEARCH

EASA's basic regulation permits the Agency to launch and finance research projects within its competence, which includes safety and environmental protection. With consideration to the pace of technological developments and changes to business models within aviation, EASA research activities need to expand beyond the Agency's internal needs and resources. Safety, environmental protection and standardization are key cross cutting issues to be tackled as early as possible within research activities and need to be addressed in a coordinated manner with the commensurate involvement of the regulators.

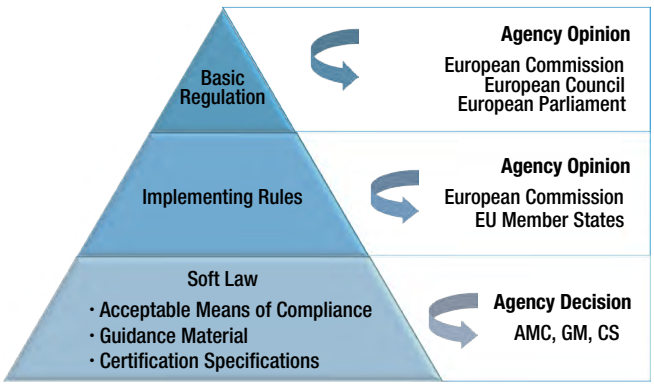

Figure 1-7. EASA Regulatory Structure.

Figure 1-8. EASA Core Activities.

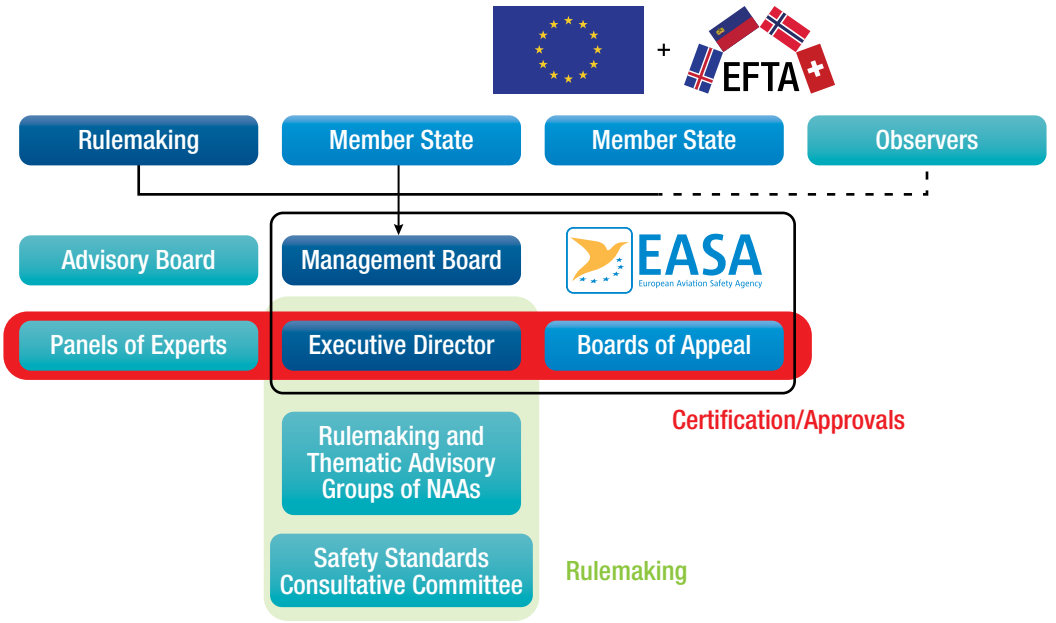

Figure 1-9. EASA Governance.

The Agency also conducts studies and provides reports concerning the safety of European and world-wide aviation. Data on the aviation system and accidents, incidents and occurrences is collected, categorized and stored and forms the base for its studies.

EASA INTERNAL STRUCTURE AND OPERATION

EASA is an independent body of the European Union with its own legal identity. It is headed and represented by its executive director. Its main structure consists of 5 directorates:

1. Executive Directorate
2. Certification Directorate
3. Flight Standards Directorate
4. Resources & Support Directorate
5. Strategy & Safety Management Directorate [**Figure 1-10**]

STAFF AND LANGUAGE

The Agency's staff consists of a limited number of officials approved by the EC or Member States to carry out management duties. Other employees are recruited by EASA on a limited basis, according to its requirements. All opinions addressed to the commission concerning actions to be adopted must be made in English language, however the regulations to be published are translated by the commission into all official languages of the community which are: Bulgarian, Czech, Croatian, Danish, Dutch, Estonian, Finnish, French, Irish, German, Greek, Hungarian, Italian, Latvian, Lithuanian, Maltese, Polish, Portuguese, Romanian, Slovak, Slovenian, Spanish, and Swedish. Applications to the Agency for certification may be filed in any of the official languages of the Community and the Agency will reply in the same language.

MANAGEMENT BOARD

A management board is composed of one representative from each Member State and one representative from the Commission. The board elects a chairperson and a deputy chairperson from among its members. The term of office is three years and is renewable. The management board exercises a supervisory function. It appoints the executive director, adopts the annual report and work program (after approval by the commission) and makes budgetary decisions. The board dictates the working procedures to be followed by the Agency. This includes guidelines, which must be approved by the commission for the allocation of certification tasks to qualified entities. The stakeholder advisory body assists the management board in its work. It comprises organizations representing aviation personnel, manufacturers, commercial and general aviation operators, maintenance industry, training organizations and air sports.

Figure 1-10. EASA Organization Structure.

MEMBER STATES ADVISORY AND TECHNICAL BODIES (MAB AND TEBS)

MAB and the TeBs are composed of representatives of the EASA members states, of selected third countries with working arrangements or specific agreements with the Agency to adopt and apply the basic regulation and its implementing rules, of specific organization, such as the European Defense Agency as well as the European Commission. The main functions of the MAB are set out in the MB Decision 19-2015, whereas those of the TeBs are described in the MAB and TeBs rules of procedure. Seven TeBs have been established:

- Aerodromes;
- Air Traffic Management/Air Navigation Services
- Air Crew
- Air Operations
- Production and Continuing Airworthiness
- General Aviation
- Safety Management
- Common Training Initiative Group

EXECUTIVE DIRECTOR

The Executive Director alone is empowered to adopt acts concerning safety and environmental protection. He or she decides on inspections and investigations and is the manager of the Agency. As such, the Executive Director is responsible for the preparation and implementation of the budget and work program as well as for all questions related to personnel.

BOARD OF APPEALS

A board of appeals is set up to review individual decisions taken by the Agency. There is a clear separation of functions between the board of appeals and the Agency. The members of the board of appeal must be independent. Pursuant to Article 108 of Regulation EU 2018/1139, an appeal may be brought against decisions of the Agency which have been taken in the following fields:

- Investigation of undertakings
- Airworthiness and Environmental Certification
- Fees & Charges regulation

Appeals cause a deferral of an action taken by the Agency only when so decided by the Agency. Appeals may be made against final decisions only. Any person may appeal a decision addressed to, or of direct and individual concern to, that person.

The board of appeal may conclude its examination either by making a decision or by referring the case to the competent body of the Agency, in which case the Agency is bound by the reasoning of the board. Provision is made for review of the decisions of the board of appeals by the Court of Justice of the European Communities under the same terms as the review of EU acts. Member states may appeal against decisions taken by the Agency on type certification and on inspections.

FINANCIAL REQUIREMENTS

The Agency's budget is financed from the following sources:

- Fees paid by the industry (64%)
- EU subsidy (23%)
- Third country contributions (2%)
- Earmarked funds (11%)

Financial control is ensured by the financial controller of the Commission. A court of auditors of the European Communities examines the Agency's accounts and publishes an annual report on EASA's activities. The discharge of the Agency budget is given to the executive director by the European parliament. A financial regulation specifying the procedure to be followed in preparing and implementing the budget is adopted by the management board, after obtaining the agreement of the Commission and the opinion of the court of auditors.

EUROPEAN UNION MEMBER STATES AND NATIONAL AVIATION AUTHORITY

Under the basic regulation, EASA member states [**Figure 1-11**] remain responsible for approving production, maintenance, and maintenance training organizations within their country as well as airworthiness certification of individual products coming into their registry. NAAs are required to use EASA procedures and EU implementing rules.

Some products remain under NAA design oversight as well. EASA has assumed responsibility on behalf of the EU for certification and oversight of all civil aviation products of member states, including non EASA associated countries, except for those products excluded by Annex I of the basic regulation. The products excluded from EASA's responsibility by Annex I remain the responsibility of each NAA of the respective state of design to manage on behalf of the EU. Annex I generally covers small fleets of historically relevant aircraft, as well as other aircraft such as ultralights and amateur built, aircraft specifically designed or modified for research, experimental or scientific purposes, etc. Products that have significant usage in the aviation system generally fall under EASA's responsibility.

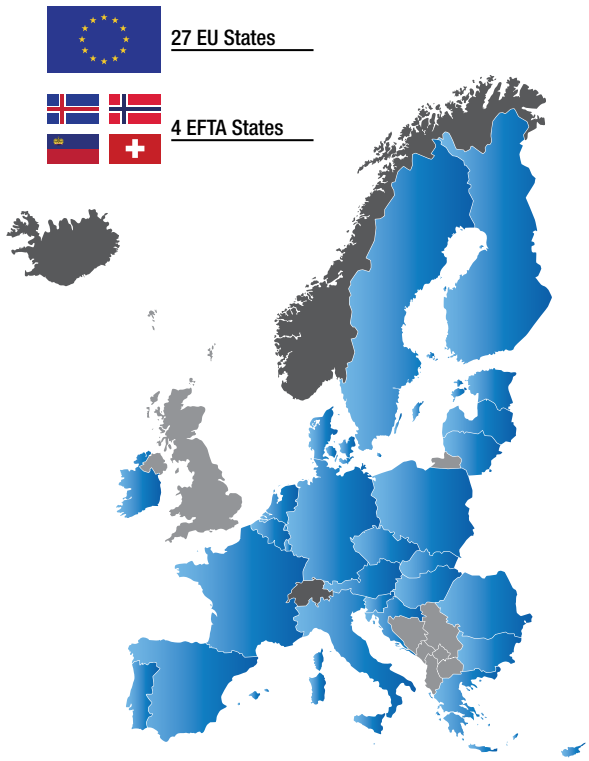

Figure 1-11. EASA Member States.

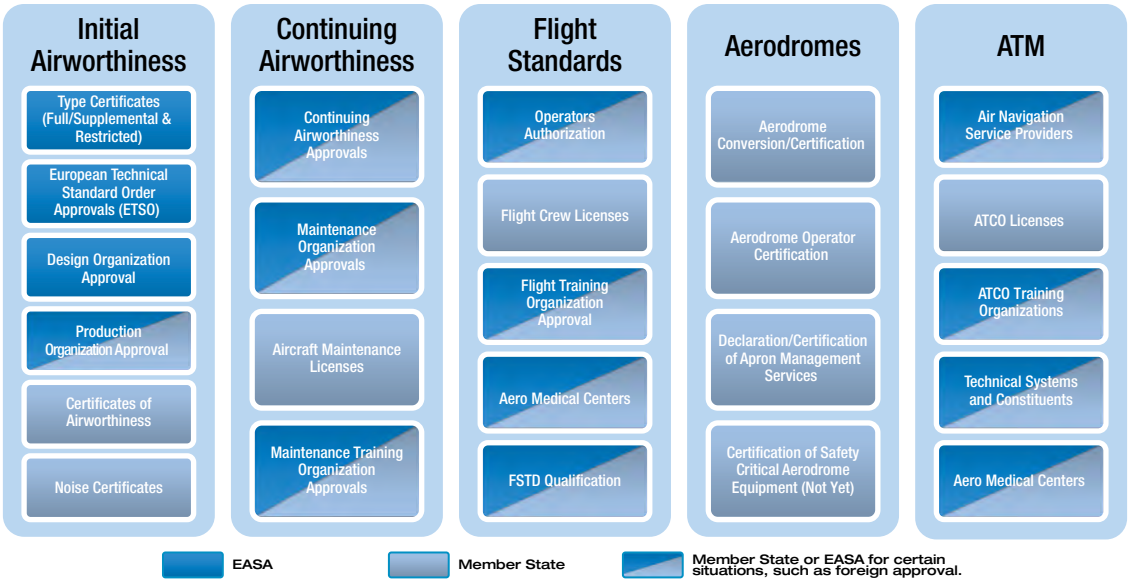

Figure 1-12. Responsibilities for certificates and approvals.

In addition, the role of EASA member states is providing expertise as appropriate for rule making and certification tasks. If required, the member states take action on a case by case basis to ensure safety or appropriate operational flexibility.

SHARING OF ROLES

Many functions of the member states are shared responsibilities with EASA as a whole or with the European Commission. Others are the sole responsibility of that country's civil aviation authority. [**Figure 1-12**]

MEMBER STATE OBLIGATIONS

Since the community is a supranational organization, under the scope of the basic regulation, member states may no longer issue their own rules, deviate from common rules, impose additional requirement to EASA rules, or conclude arrangements with third countries.

BILATERAL AGREEMENTS CONCLUDED BY THE EUROPEAN COMMISSION

EASA RELATIONS WITH OTHER AVIATION AUTHORITIES

EASA rule making is tightly coordinated with international cooperation. Development of international standards may become EU law. There are agreements and international arrangements in place in the European Community which are considered during EASA operations. EASA works in concert with member state national aviation authorities to be effective.

MULTILATERAL COOPERATION

EASA helps the EU and its member states in harmonizing its rules and standards on the international level. Specialists from the EASA participate in the work of ICAO.

BILATERAL COOPERATION

The Agency acts in a way to promote circulation of European products and services throughout the world. It assists third country regulators with certification of European products and service providers. Reciprocally, European certificates may be issued on the basis of certificates having already been issued in third countries when there is sufficient confidence in the standards used by those countries. To do this, the EU must conclude bilateral agreements or arrangements dependent on the nature of the subject. Functioning arrangements have been concluded with Brazil, Canada, China, Israel, Japan, New Zealand, Russia, Saudi Arabia, Singapore, United States and the Committee of Aviation Interstates of the Community of Independent States.

INTERNATIONAL COOPERATION

To ensure the highest level of civil aircraft safety, because European citizens travel throughout the world and because third country aircraft use EC airports, the EASA assists developing countries in improving their standardization rules. In these endeavors, the Agency acts in tandem with the European Commission on the development and execution of significant cooperation projects in Asia, Africa and Central America.

RULES AND AUTHORITY

The European Commission has adopted standards for rule making. The charts in **Figure 1-13 and 1-14** illustrate the establishing regulations and the locations of various functions under those regulations.

REGULATION 2018/1139 (THE BASIC REGULATION)

Regulation EU 2018/1139 of the European Parliament and the EU Council was passed in July 2018. It established common rules in the field of civil aviation, and it established the European Aviation Safety Agency. In the process, it paved the way for EASA authority and development while repealing other council directives on aviation previously on the books. This regulation applies to the design, production, maintenance and operation of aeronautical products, parts and appliances, as well as personnel and the organizations involved in the design, production and maintenance of such products, parts and appliances. It also applies to personnel and organizations involved in the operation of aircraft. Regulation EU 2018/1139 does not apply when products, parts,

appliances, personnel and organizations are engaged in military, customs, police, or similar services. Member states must ensure that such services are practicable in their own countries and are aligned with objective set forth in EU 2018/1139. The new basic regulation formalizes EASA's role in the domain of drones and urban air mobility, enabling the Agency to prepare rules for all sizes of civil drones and harmonize standards for the commercial market across Europe. The regulation enlarges the Agency's role in areas such as in environmental protection, research and development, or international cooperation. The new mandate also gives EASA a coordinating role in cyber security in aviation.

REGULATION NO 748/2012 (INITIAL AIRWORTHINESS)

The commission regulation EU No 748/2012 of 3 August 2012 established implementing rules for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production organizations. It defines common technical requirements and administrative procedures for the airworthiness and environmental certification of products, parts and appliances. EU 748/2012 specifies and/or authorizes the following:

- The issue of type certificates, restricted type certificates, supplemental type certificates and changes to those certificates.

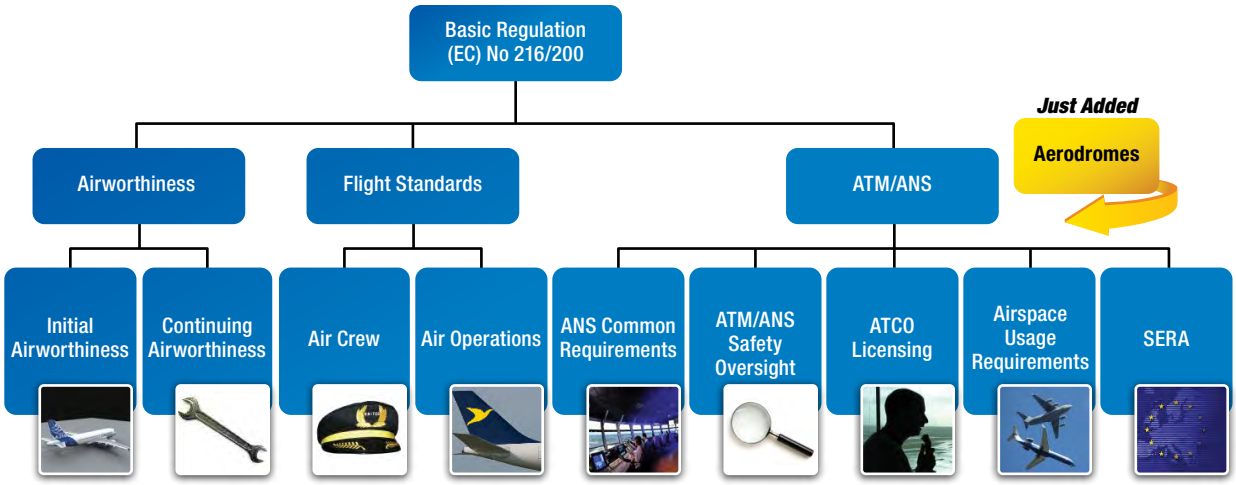

Figure 1-13. Current Regulations.

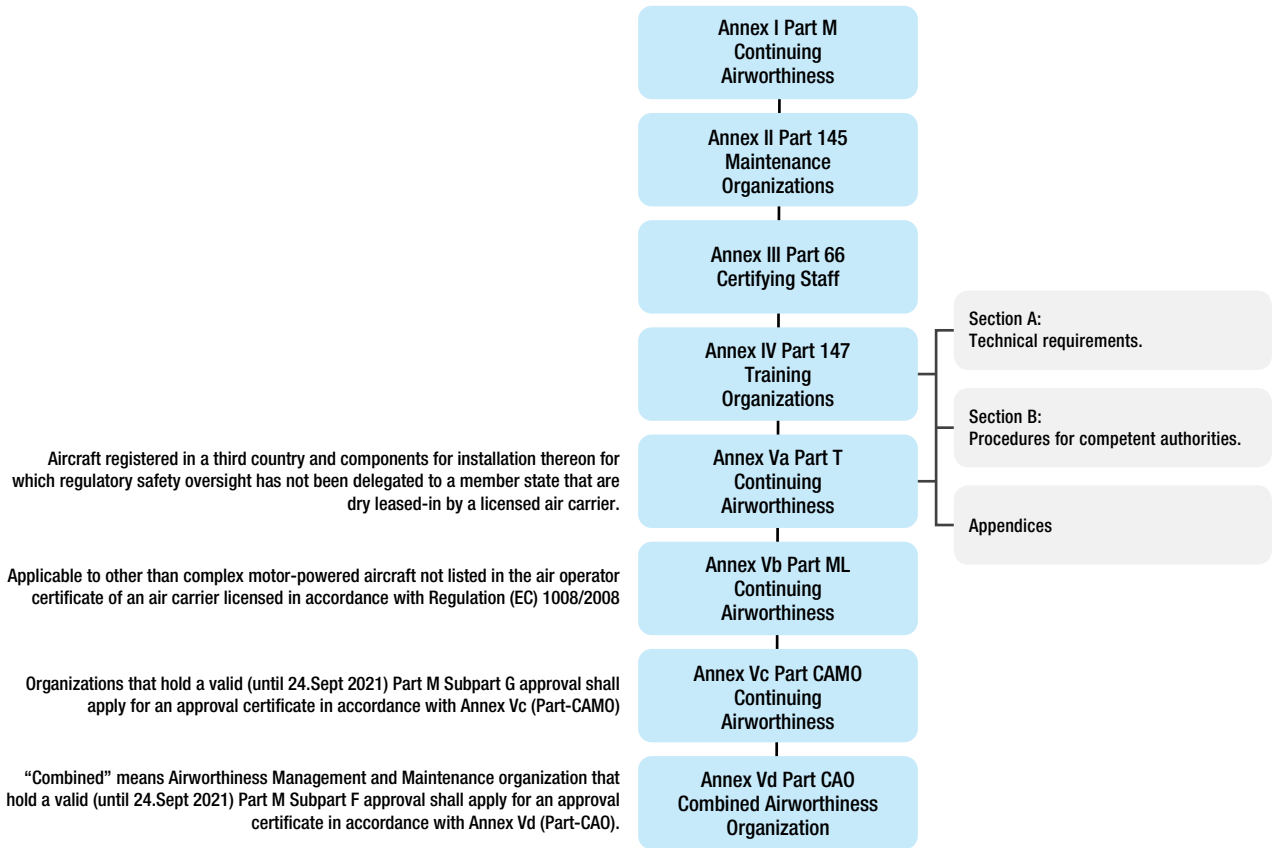

Figure 1-14. Initial and Continuing Airworthiness Regulations Schematic.

- The issue of certificates of airworthiness, restricted certificates of airworthiness, permits to fly and authorized release certificates.
- The issue of repair design approvals.
- The showing of compliance with environmental protection requirements.
- The issue of noise certificates.
- Identification of products, parts and appliances.
- Certification of certain parts and appliances.
- The certification of design and production organizations.
- The issue of airworthiness directives.

REGULATION 1321/2014 (CONTINUED AIRWORTHINESS)

The commission regulation EU No 1321/2014 was passed on 26 November 2014. It deals with the continued airworthiness of aircraft and aeronautical products, parts and appliances, and the approval of organizations and personnel involved in these tasks. This regulation establishes common technical requirements and the administrative procedures for ensuring the continuing airworthiness of aircraft. This includes any component for the installation on these aircraft that are either registered in a member state or registered in a third country and used by an operator for which a member state ensures oversight of operations. The provisions of EU 1321/2014 related to commercial air transport are applicable to licensed air carriers as defined by EU law. The commission regulation EU No 1321/2014 consists of the following Annexes:

- Annex I (Part M) – defines the requirements for the continuing airworthiness of aircraft and components.
- Annex II (Part 145) – sets up the requirements for the approval of organizations involved in the maintenance of large aircraft or of the aircraft used for commercial air transport, and components intended for fitment thereto.
- Annex III (Part 66) – lays down the requirements for the qualification of certifying staff.
- Annex IV (Part 147) – establishes the requirements for organizations involved in the training of certifying staff.
- Annex Va (Part T) - establishes the requirements for continuing airworthiness of aircraft registered in a third country for which their regulatory safety oversight has not been delegated to a member state when they are dry leased by a licensed air carrier.

RELATIONSHIP BETWEEN THE ANNEXES

Aircraft used for commercial air transport must be maintained in an airworthy condition in accordance with Part M of EASA regulations. Maintenance must be performed by a Part 145 approved maintenance organization using Part 66 qualified personnel trained in a Part 147 approved training organization.

RELATIONSHIP BETWEEN "HARD LAW" AND SOFT LAW (AMC, GM AND CSS SOFT LAW)

EU aviation regulations are prepared by EASA and can be divided into two parts; hard law and soft law. [**Figure 1-15**]

- *Hard Law*—which goes through parliamentary approval process and is published as commission regulations (with a unique ID in the form "EU YYYY/NNNN" and signed by the President of the commission. Hard law (also called binding law) defines requirements about what must be fulfilled.
- *Soft Law*—defines how regulatory requirements should be fulfilled in the form of Acceptable Means of Compliance (AMC), and Guidance Material (GM). The term "should" is used for legal and logical reasons to allow operators to select either the AMC advice by EASA or to propose their own alternative means of compliance.

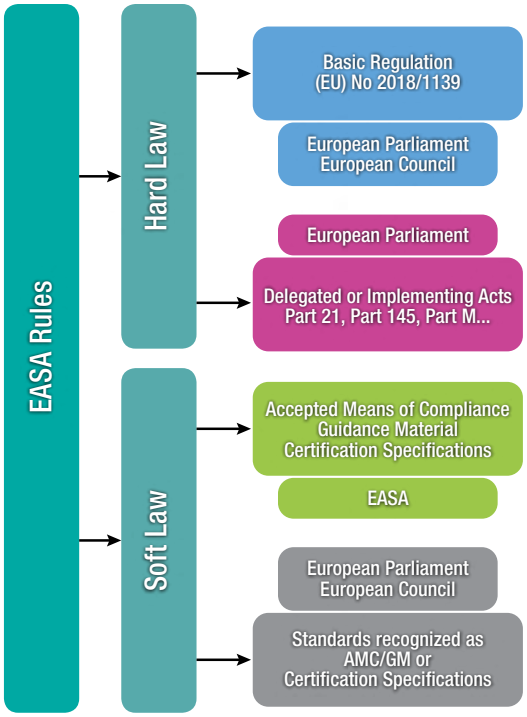

Figure 1-15. Examples of hard law and soft law.

HARD LAW

Implementing Rules (IRs) are binding in their entirety and used to specify a high and uniform level of safety and uniform conformity and compliance. They detail how to comply with the essential requirements of the basic regulation and regulate the subject matters included in its scope. The IRs are adopted by the European Commission in the form of regulations known as "Commission Regulations".

The basic regulation (EU 2018/1139) is an example of hard law, meaning its legal obligations are binding and can be legally enforced before a court. Underneath the basic regulation are a number of other regulations which are also hard law, like Commission Regulation EU 748/2012 (Part 21), Commission Regulation EU 1321/2014, Commission Regulation EU 965/2012 (Air Operations) and many others. [**Figure 1-13**]

SOFT LAW

ACCEPTABLE MEANS OF COMPLIANCE (AMC)

Acceptable Means of Compliance are non binding. AMCs serves as a means by which the requirements contained in hard law and implementing rules can be met. The AMC illustrates a means, but not the only means, by which a requirement of hard law can be met. Satisfactory demonstration of compliance using a published AMC shall provide for presumption of compliance

with the related requirement. It is a way to facilitate certification tasks for the applicant and the competent authority. However, NAAs and organizations may decide to show compliance with the requirements using other means. Both the NAAs and the organizations may propose alternative means of compliance (AltMoC). "Alternative Means of Compliance" are those that propose an alternative to an existing AMC. AltMoC proposals must be accompanied by evidence of their ability to meet the intent of the IR. Use of an existing AMC gives the user the benefit of compliance with the IR.

GUIDANCE MATERIAL (GM)

Guidance Material is non binding explanatory and interpretation material on how to achieve the requirements contained in the basic regulation, the IRs, the AMCs and the CSs. It contains information, including examples, to assist the user in the correct understanding and application of the basic regulation, its IRs, AMCs and the CSs.

CERTIFICATION SPECIFICATIONS (CS)

Certification specifications are technical standards that EASA has adopted to fulfill the fundamental requirements of the basic regulation. These standards are employed to determine the certification basis, which is a set of criteria that an aerodrome operator must meet. If an operator is unable to meet the CS recommendation, they may propose an equivalent level of safety that demonstrates how they would comply with the CS intent. As part of a mutually agreed certification basis, the CS becomes binding on an individual basis for the applicant.

SPECIAL CONDITIONS

Special conditions are detailed technical specifications that are determined by the NAA for an aerodrome. These specifications come into play when the certification specifications established by EASA are deemed inadequate or inappropriate to ensure compliance with the essential requirements of Annex VII to the basic regulation. This inadequacy or inappropriateness may arise from the design features of the aerodrome or from safety concerns identified through experience in operating similar aerodromes with similar design features. Similar to certification specifications, special conditions become binding on an individual basis for the applicant as part of a mutually agreed certification basis.

OCCURRENCE REPORTING ACCORDING TO REGULATION EU 376/2014

Regulation EU 376/2014 of the European Parliament on the reporting, analysis, and follow up of occurrences in civil aviation, aims to improve aviation safety by ensuring that relevant safety information relating to civil aviation is reported, collected, stored, protected, exchanged, disseminated, and analyzed. It also sets out requirements for follow up actions. This regulation is a key component of the European Union's strategy to enhance aviation safety, by promoting a just culture and preventing accidents and incidents. The regulation applies to occurrences in all sectors of civil aviation.

Regulation 376/2014 establishes a framework, across aviation domains and at each level (industry, national and European), to ensure the collection of as complete as possible safety occurrence data and its analysis with a view to support the full spectrum of safety management activities, including the adoption and implementation of mitigation actions where relevant.

The reporting, analysis and follow up of occurrences is supported by a broader safety risk management process that helps identify the main safety issues and risks. This process involves continuous dialogue between the industry and the competent authorities with full engagement from all. This notably includes the provision of feedback and lessons learned to improve safety. This regulation aims to ensure that the industry is aware of the risks it is facing and takes relevant measures to mitigate those risks.

MANDATORY REPORTING

Individuals and organizations engaged in civil aviation activities are required to report any safety related occurrences. This includes a broad range of personnel including flight crews, maintenance engineers, air traffic controllers and airport operators.

Regulation EU 376/2014 specifies a list of occurrences that may represent a significant risk to aviation safety which must be reported. These include occurrences related to:

- The operation of the aircraft, such as collision related and inflight events.
- Technical conditions, maintenance and repair of an aircraft such as structural defects and system malfunctions.
- Air navigation services and facilities such as collisions, near collisions or potential for collisions.
- Aerodromes and ground services, including handling of passengers, bags, mail and cargo.

The responsible persons (pilot, air traffic controller or the person signing an airworthiness certificate) and organizations in each case must report occurrences within 72 hours of becoming aware of them, unless exceptional circumstances prevent this.

VOLUNTARY REPORTING

Beyond mandatory reporting, the regulation encourages voluntary reporting of other safety related information that may not be captured under mandatory reporting requirements but could contribute to identifying safety risks.

OCCURRENCE REPORTING SYSTEM

Each organization established in an EU country must establish an acceptable system for collection, evaluation, processing, analysis and storage of occurrences reported, including those reported to them by the organizations. Small organizations may be allowed to put in place a simplified mechanism for the collection and storage of details of occurrences.

STORAGE OF SAFETY OCCURRENCES AND RECOMMENDATIONS

- Each EU country and EASA must submit the occurrences they have collected to a European Central Repository (ECR) that is managed by the European Commission. The ECR maintains safety recommendations issued by the country's safety investigation authorities.
- Implementing Decision EU 2019/1128 lays down rules for the management of the ECR, requiring that all the

safety recommendations and their responses contained therein be made available to the general public through a public website.
- From the day of the reception of the initial report, each competent authority has 30 days to integrate this report in the ECR. In the case of follow up, it has two months to send updated information to the ECR.

RISK CLASSIFICATION

Commission Delegated Regulation EU 2020/2034 sets out a common European risk classification scheme which is defined as a methodology to categorize the overall safety risk of an occurrence according to the worst likely accident outcome and the likelihood of this potential outcome to occur. The overall purpose is to determine the safety risk of an occurrence and thus help the relevant entities in their assessment of occurrences and in determining where to focus their efforts to mitigate a reoccurrence.

EXCHANGE OF INFORMATION

Information on occurrences must be shared within the EU to facilitate the identification of safety risks. EASA plays a central role in collecting, analyzing, and disseminating occurrence information among member states and the aviation industry. Countries of the EU and of the European Economic Area will have the EASA exchanged safety related information stored in their respective databases. Interested parties, as listed in Regulation EU 376/2014 may request and obtain information contained in the ECR under certain conditions.

PROTECTION OF DATA AND CONFIDENTIALITY

Handling of reports must be done with a view to preventing the use of information for purposes other than safety. In order to promote a "just culture", safeguards must be put in place to keep the identity of the reporter and those mentioned in the occurrence reports confidential. In this context, EU countries also have the obligation to designate a just culture body responsible for the implementation of the just requirements set forth in Regulation EU 376/2014.

Employees must not be subject to any prejudice by their employer on the basis of an occurrence report. A few exceptions are defined such as the case of willful misconduct or gross negligence on the part of an employee.

RELATIONSHIP BETWEEN THE ANNEXES

Annex Vb (Part ML) - Simplifies existing maintenance rules and offers a less prescriptive approach to maintenance programs, airworthiness reviews, defect deferments, and time between overhaul extensions. It also provides additional privileges for pilots, owners, independent certifying staff, and small maintenance organizations (MROs).

Annex Vc (Part CAMO) - Applicable for both aircraft used by licensed air carriers as well as complex motor powered aircraft. It supersedes the existing Subpart G of Annex I (Part M) but both are valid during the transition. Part CAMO includes provision for safety management systems.

Annex Vd (Part CAO) -Combined Airworthiness Organization (Part CAO) provides a simplified organization approval for general aviation which alleviates many of the requirements (For example; No safety management systems.) The Part CAO was not created only to replace the Subpart F maintenance organization, but rather to offer a completely new type of organization which is specifically adapted to the needs of GA.

RELATIONSHIP BETWEEN THE ANNEXES (PARTS)

The relationships between EASA Annexes is characterized by their collective aim to cover all aspects of aviation safety comprehensively. Some Parts, such as Part M, require compliance with other Parts, such as Part 145 or Part 66, for certain activities. This means that some organizations may need to integrate multiple Parts into their operations to ensure compliance and safety.

For example, maintenance tasks specified in Part M must be carried out by organizations approved under Part 145. Similarly, maintenance personnel must hold appropriate licenses as per Part 66, and training must be completed at approved training organizations as per Part 147.

Part M, Part CAMO, and Part CAO set out the requirements for continuing airworthiness management, which must be carried out by organizations approved under Part 145. These organizations also need personnel licensed under Part 66, who have been trained by organizations approved under Part 147. [**Figure 1-16**]

The requirements of some parts must be met by other parts. For example, Part M requires that continuing airworthiness management be carried out by a CAMO (as per Part CAMO) or by a CAO (as per Part CAO). Similarly, maintenance tasks specified in Part M must be carried out by organizations approved under Part 145.

Each Part supports and complements the others, creating a cohesive regulatory framework that ensures safety across all areas of aviation.

INTERACTIONS BETWEEN DIFFERENT PARTS

Interactions of Part M with other Parts:
- Part M requires compliance with Part 145 for maintenance activities.
- Part M requires maintenance personnel to hold licenses as per Part 66.

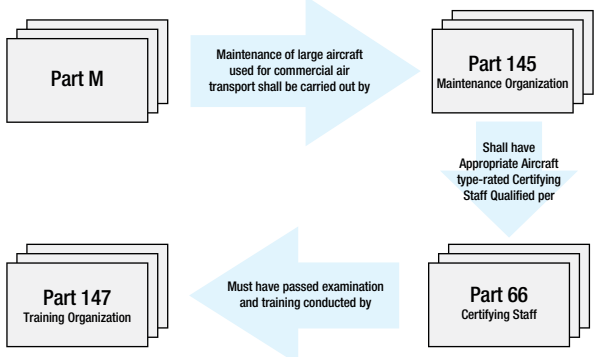

Figure 1-16. The relationship between Part M, Part 145, Part 147 and Part 66.

- Part M interacts with Part 147 by setting requirements for maintenance training organizations.
- Part M interacts with Part T for oversight of third country registered aircraft.
- Part M interacts with Part ML by establishing airworthiness requirements for light aircraft.
- Part M interacts with Part CAMO by requiring compliance with continuing airworthiness management.

Interactions of Part 145 with other Parts:
- Part 145 must comply with regulations specified in Part M for maintenance activities.
- Part 145 requires maintenance personnel to hold licenses as per Part 66.
- Part 145 interacts with Part 147 by certifying maintenance training organizations.
- Part 145 interacts with Part T for oversight of third-country registered aircraft.
- Part 145 interacts with Part ML by applying airworthiness requirements to light aircraft.
- Part 145 interacts with Part CAMO by establishing requirements for continuing airworthiness management.

Interactions of Part 66 with other Parts:
- Part 66 interacts with Part 145 by specifying the qualifications for maintenance personnel.
- Part 66 interacts with Part 147 by requiring completion of approved training programs.
- Part 66 interacts with Part T for oversight of third country registered aircraft.
- Part 66 interacts with Part ML by setting the standards for maintenance personnel in light aircraft.
- Part 66 interacts with Part CAMO by establishing qualifications for continuing airworthiness management personnel.

Interactions of Part 147 with other Parts
- Part 147 requires individuals seeking a Part 66 license to complete an approved training program provided by a Part 147 approved organization.
- Part 147 interacts with Part 145 by certifying maintenance training organizations.
- Part 147 interacts with Part T for oversight of third country registered aircraft.
- Part 147 interacts with Part ML by setting the standards for maintenance training organizations in light aircraft.
- Part 147 interacts with Part CAMO by establishing requirements for continuing airworthiness management training.

Interactions of Part T with other Parts:
- Part T interacts with Part 145 by requiring compliance with airworthiness requirements for maintenance activities.
- Part T interacts with Part 66 by specifying the licensing requirements for maintenance personnel.
- Part T interacts with Part 147 by requiring completion of approved training programs.
- Part T interacts with Part ML by applying airworthiness requirements to light aircraft.
- Part T interacts with Part CAMO by establishing airworthiness requirements for continuing airworthiness management.

Interactions of Part ML with other Parts:
- Part ML requires compliance with airworthiness requirements specified in Part M and Part T.
- Part ML interacts with Part 145 by applying airworthiness requirements to maintenance activities.
- Part ML interacts with Part 66 by setting the standards for maintenance personnel in light aircraft.
- Part ML interacts with Part 147 by setting the standards for maintenance training organizations in light aircraft.
- Part ML interacts with Part CAMO by establishing airworthiness requirements for continuing airworthiness management

Interactions of Part CAMO with other Parts:
- Part CAMO is applicable for both aircraft used by licensed air carriers as well as complex motor powered aircraft.
- Part CAMO requires compliance with airworthiness requirements specified in Part M and Part T.
- Part CAMO interacts with Part 145 by requiring compliance with maintenance requirements.
- Part CAMO interacts with Part 66 by specifying the licensing requirements for continuing airworthiness management personnel.
- Part CAMO interacts with Part 147 by establishing requirements for continuing airworthiness management training.
- Part CAMO interacts with Part ML by applying airworthiness requirements to light aircraft.

Interactions of Part CAO with other Parts:
- Part CAO requires compliance with airworthiness requirements specified in other Parts, such as Parts M and ML, for aircraft used in operations.
- Part CAO interacts with Part CAMO by requiring compliance with continuing airworthiness management requirements.
- Part CAO interacts with other Parts, such as Parts 145 and 66, to ensure that maintenance activities and personnel meet the necessary standards for safe operation.

RELATIONSHIP BETWEEN REGULATION (EU) NO 965/2012 AND (EU) NO 1178/2011

Regulation EU 965/2012 (Air Operations) and EU 1178/2011 (Aircrew) are two cornerstone pieces of the European Union legislation. Relationship between Regulation EU 965/2012 and EU 1178/2011 is characterized by their complementary roles in ensuring the safety and efficiency of air operations within the EU. Regulation 965/2012 sets the framework for safe air operations, while Regulation 1178/2011 ensures that the individuals piloting and operating these flights are qualified and competent. Together, they form a cohesive and comprehensive approach to aviation safety, addressing both the operational and human factors that contribute to safe air transport.

REGULATION (EU) NO 965/2012 (AIR OPERATIONS)

This regulation establishes detailed rules for commercial and non-commercial air operations with both fixed wing aircraft and helicopters. It covers various aspects of air operations, including operating requirements, flight crew requirements in the context of operations, and conditions for the operation of aircraft. The primary goal is to ensure a high and uniform level of safety for air operations across the EU. It includes provisions for operator certification, operating procedures, and the operational suitability of aircraft and equipment used in operations.

REGULATION (EU) NO 1178/2011 (AIRCREW)

This regulation lays down the technical requirements and the administrative procedures related to civil aviation aircrew. It encompasses pilot licensing, the training and medical fitness of flight crew, and the recognition of licenses and qualifications from other member states. The primary goal is to ensure that flight crew operating EU registered aircraft meet uniform high standards of training, performance and medical fitness.

HOW (EU) NO 965/2012 AND (EU) NO 1178/2011 COMPLEMENT EACH OTHER

- Crew Licensing and Operations: The qualifications and licensing of aircrew detailed in Regulation 1178/2011 are fundamental to the operational requirements of Regulation 965/2012. For instance, the crew members operating a flight under Regulation 965/2012 must hold the licenses and meet the training requirements specified in Regulation 1178/2011.
- Air Operator Certificate: Regulation 965/2012 requires commercial operators to obtain an AOC by demonstrating compliance with operational standards, including having appropriately licensed crew as required by Regulation 1178/2011.
- Continuous Oversight and Training: Both regulations mandate continuous oversight and recurrent training. Regulation 1178/2011 specifies the need for continuous training and reevaluation of aircrew, which is critical for maintaining operational safety standards as outlined in Regulation 965/2012.

Question 1-1
Which organization sets the standards by which all (most) other authorities follow?

Question 1-2
What are the five basic objectives of ICAO regarding civil aviation?

Question 1-3
Which European organization has the final say over matters pertaining to civil aviation?

Question 1-4
Which organization develops the standards and rules pertaining to European civil aviation?

Question 1-5
Which organization is responsible for approving maintenance facilities, maintenance training organizations and maintenance personnel?

Question 1-6
What is the purpose and result of the "Basic Regulation"?

Question 1-7
What are Certification Specifications?

Question 1-8
What is the function of the European Central Repository?

Question 1-9
In the case of a safety related occurrence, how long does the responsible party have to report it and its details?

Question 1-10
What is the primary relation between Part 66 and Part 147?

SUBMODULE 1 PRACTICE ANSWERS

Answer 1-1
ICAO – International Civil Aviation Organization; a division of the United Nations.

Answer 1-2
Safety; Navigation; Security; Economic development; Environmental protection.

Answer 1-3
The European Commission (EC)

Answer 1-4
European Aviation Safety Agency (EASA)

Answer 1-5
The national authority (NAA) of the member state where that organization is located.

Answer 1-6
The Basic Regulation created EASA as the appointed agency to govern civil aviation.

Answer 1-7
Technical standards developed by EASA by which all types of civil aviation operators must conform.

Answer 1-8
To collect, store and distribute information regarding accidents and other safety related occurrences.

Answer 1-9
72 hours of becoming aware of the occurrence.

Answer 1-10
A Part 147 training organization teaches the requirements of Part 66.

Certifying Staff – Maintenance

Submodule 2

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		A1
10.2	**Certifying Staff — Maintenance** Deep understanding of Part-66 maintenance licences with the associated privileges and authorisations, and how to exercise them properly for the different aircraft categories.	2

10.2 - CERTIFYING STAFF

EASA Part 66 succeeds the Joint Aviation Requirements (JAR) Part 66 that previously bound the European Union nations into a collaborative aviation safety effort. Part 66 sets forth the requirements applicable to aircraft maintenance staff that issue certificates of release to service (CRS) of aircraft and aircraft components under the framework of Part 145 approved maintenance organizations. Note that until specific requirement for certifying staff for components are added to EASA regulations; the requirements stated in the national laws of each member state shall continue to apply. A brief time line of the evolution that has resulted in today's Part 66 is as follows:

- Date of approval of the JAR66 - December 1997
- Beginning of Implementation of JAR66 - June 1998
- Mandatory Application of JAR66 - June 2001
- EASA is created into force - September 2003
- EASA Part 66 becomes in force - September 2004

GENERAL

The implementation of EASA Part 66 regulations (Annex III of the EC 1321/2014) is directly linked to EASA Part 145 requirements. Part 145, paragraph 145.A.30 (g) and (h) specify:

g. Any organization maintaining aircraft, except where stated otherwise, shall in the case of aircraft line maintenance, have appropriate aircraft rated certifying staff qualified as category B1, B2, B3, as appropriate, in accordance with Annex III (Part 66) and point 145.A.35.

In addition, such organizations may also use appropriately task trained certifying staff holding privileges described in Part 66 Annex III and point 145.A.35, to carry out minor scheduled line maintenance and simple defect rectification. The availability of such certifying staff shall not replace the need for category B1, B2, B3 certifying staff, as appropriate.

h. Any organization maintaining aircraft, except where stated otherwise, shall in the case of base maintenance of large aircraft, have appropriate aircraft type rated certifying staff qualified as category C in accordance with Part 66 and 145.A.35. In addition the organization shall have sufficient aircraft type rated staff qualified as category B1 and B2 in accordance with Part 66 and 145.A.35 to support the category C certifying staff.

B1 and B2 support staff shall ensure that all relevant tasks or inspections have been carried out to the required standard before the category C certifying staff issues the certificate of release to service. The organization shall maintain a register of any such B1 and B2 support staff.

The category C certifying staff shall ensure that compliance has been met and that all work required by the customer has been accomplished during the particular base maintenance check or work package, and shall also assess the impact of any work not carried out with a view to either requiring its accomplishment or agreeing with the operator to defer such work to another specified check or time limit.

PART 66

The basis of Part 66 is Annex III of Regulation EC 1321/2014. The following sections establish the requirements for the issue of an aircraft maintenance license and conditions of its validity and use for airplanes and helicopters. A blank Part 66 license is shown in **Forms 2-1, A-D**.

AIRCRAFT MAINTENANCE LICENSES

Aircraft maintenance licenses include the following categories:

- Category A
- Category B1
- Category B2
- Category B3
- Category C

License categories A and B are subdivided into subcategories depending on the kind of aircraft and the type of powerplant(s) installed. These subcategories are:

- A1 and B1.1 airplanes turbine
- A2 and B1.2 airplanes piston
- A3 and B1.3 helicopters turbine
- A4 and B1.4 helicopters piston

- B2: Avionics
- B2L: Applicable to all aircraft other than those in Group 1 divided in systems ratings, Com/Nav, instruments, autoflight, surveillance, airframe systems.
- B3: Applicable to piston engine aeroplanes non-pressurized with MTOM under 2 tons
  - L1C: Composite sailplanes
  - L1: Sailplanes
  - L2C: Composite powered sailplanes and composite ELA1 aeroplanes,
  - L2: powered sailplanes & ELA1 aeroplanes,
  - L3H: Hot air balloons
  - L3G: Gas balloons
  - L4H: Hot air airships
  - L4G: ELA2 gas airships
  - L5: Gas airships other than ELA2.
  - C: Shall permit the holder to issue CRS; following base maintenance.
- B3: applicable to piston engine non-pressurized airplanes of 2 000 kg MTOM and below.

OBTAINING AN EASA B1 OR B2 PART 66 LICENSE

In order to get an EASA Part 66 Aircraft Maintenance License (AML), an applicant needs:

- Basic knowledge (66.A.25)
- Basic experience (66.A.30)

In order to get an aircraft Type Rating (TR) endorsement in the AML, an applicant needs:

- Theoretical and practical type training.
- On the Job Training (OJT) for the first TR.

These two schemes depict the most common paths. The first applies to B1 and B2 licenses for Group 1 aircraft. [**Figure 2-1**] The second applies to B1 and B2 licenses other than Group 1 aircraft. [**Figure 2-2**]

AIRCRAFT GROUPS

For the purpose of ratings on an aircraft maintenance license, aircraft shall be classified in the following groups: [**Figure 2-3**]

- Group 1: Complex engine powered aircraft as well as multiple engine helicopters, airplanes with maximum certified operating altitude exceeding FL290, aircraft equipped with fly-by-wire systems and other aircraft requiring an aircraft type rating when defined so by the Agency.
- Group 2: Aircraft other than those in Group 1 belonging to the following subgroups:
  1. Sub-group 2a: single turbo-propeller engine airplanes.
  2. Sub-group 2b: Single turbine engine helicopters.
  3. Sub-group 2c: Single piston engine helicopters.
- Group 3: Piston engine airplanes other than those in Group 1.
- Group 4: Sailplanes, powered sailplanes, balloons, and airships other than those in Group 1.

APPLICATION FOR AN AIRCRAFT MAINTENANCE LICENSE

a. An application for an aircraft maintenance license or change to such license shall be made on an EASA Form 19 in a manner established by the competent authority and submitted thereto. [**Forms 2-2, A-B**]

b. The application for a change to an aircraft maintenance license shall be made to the competent authority of the member state that issued the aircraft maintenance license.

c. In addition to the documents required in points 66.A.10(a), 66.A.10(b) and 66.B.105, as appropriate, the applicant for additional basic categories or subcategories to an aircraft maintenance license shall submit his/her current original aircraft maintenance license to the competent authority together with the EASA Form 19.

d. Where the applicant for change of the basic categories qualifies for such change via the procedure referred to in point 66.B.100 in a member state other than the member

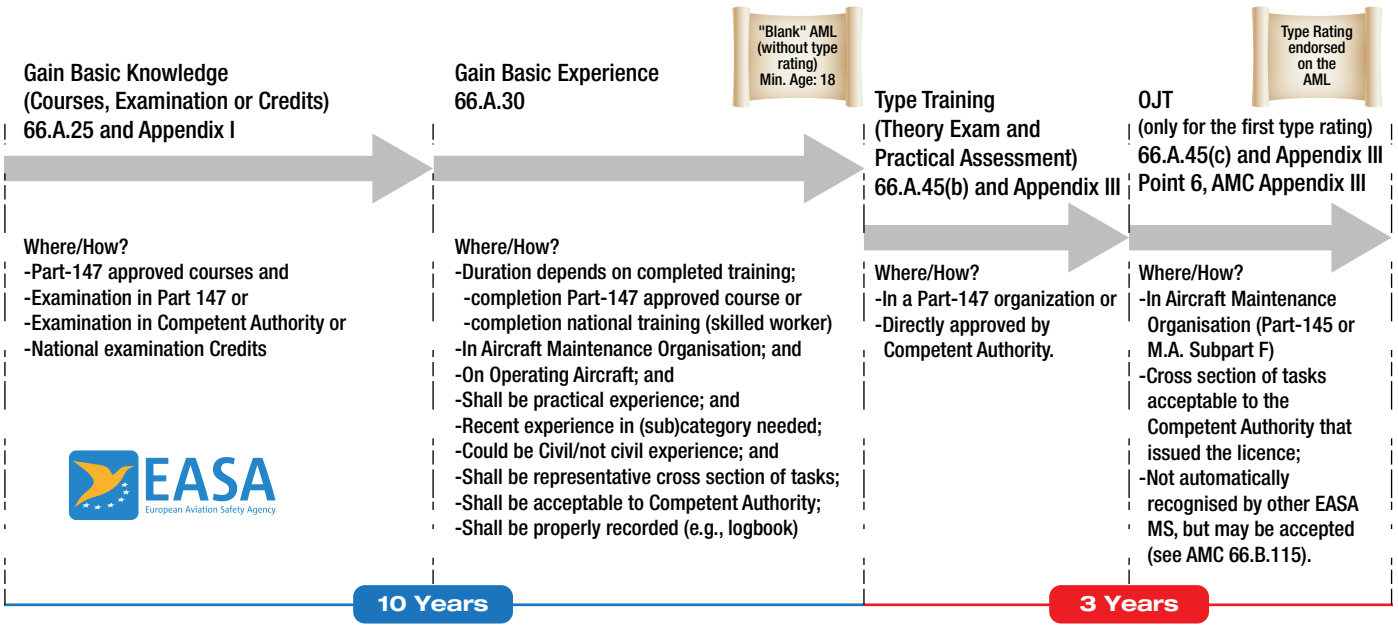

Figure 2-1. Part-66 Aircraft Maintenance License (AML) B1 and B2 categories with Group 1 Aircraft.

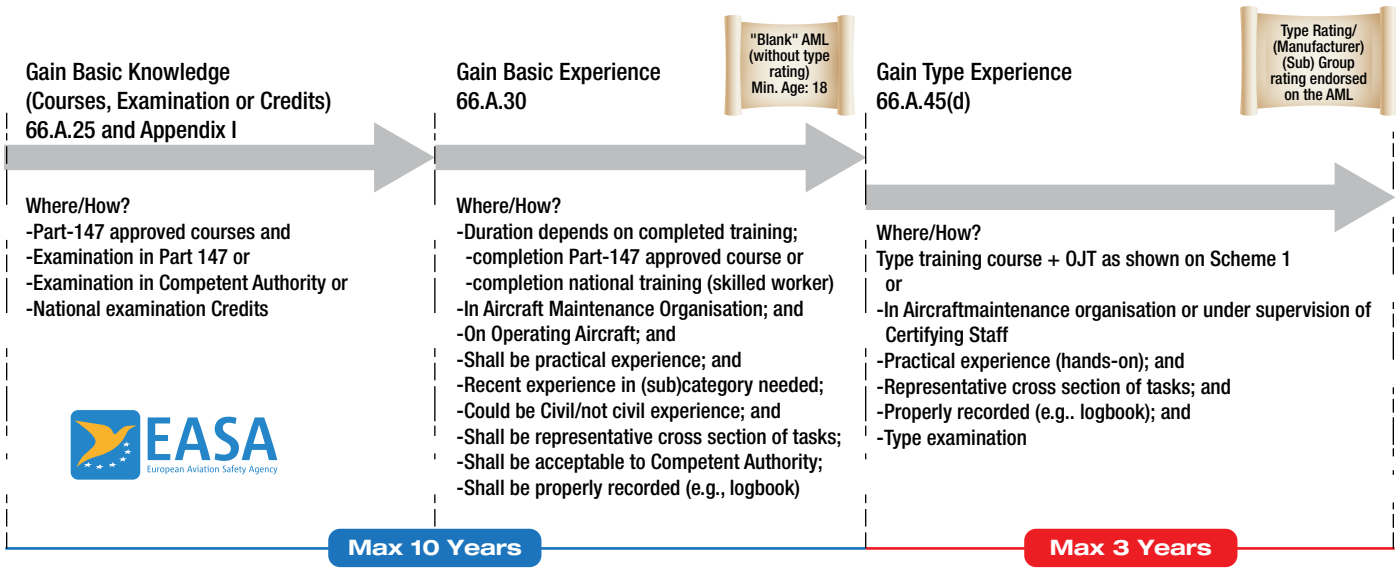

Figure 2-2. Part-66 Aircraft Maintenance License (AML) B1 and B2 Other than Group 1 Aircraft.

Category Subcategory Groups	A, B1, & C	B2	B2L	B3	L				
					L1C & L1	L2C & L2	L3H & L3G	L4H & L4G	L5
1 – Complex motor-powered aircraft – Multi-engine helicopters – Aeroplanes above FL290 – Aircraft with fly-by-wire systems – Any other aircraft when definded by the Agency	X	X							
1 – Gas airships other ELA2		X							X
2 2a: Single turboprop aeroplanes 2b: Single turbine helicopters 2c: Single piston helicopters	X	X	X						
3 – Piston engine aeroplanes	X	X	X						
3 – Piston engine aeroplanes (non-pressurized of 2 000 kg MTOM and below)	X	X	X	X					
3 – ELA1 piston engine aeroplanes	X	X	X	X		X			
4 – Sailplanes – Powered sailplanes – Balloons – Airships not in Group 1		X X X X	X X X X		X	X X	X	X	X

Figure 2-3. Licenses relevant to each group of aircraft.

state which issued the license, the application shall be sent to the competent authority referred to in point 66.1.

e. Where the applicant for a change of the basic categories qualifies for such change via the procedure referred to in point 66.B.105 in a member state other than the member state which issued the license, the maintenance organization approved in accordance with Annex II (Part 145) shall send the aircraft maintenance license together with the EASA Form 19 to the competent authority referred to in point 66.1 for stamp and signature of the change or reissue of the license, as appropriate.

f. Each application shall be supported by documentation to demonstrate compliance with the applicable theoretical knowledge, practical training and experience requirements at the time of application.

Note that an applicant for an aircraft maintenance license shall be at least 18 years of age.

PRIVILEGES OF AIRCRAFT MAINTENANCE LICENSES

A category A aircraft maintenance license permits the holder to issue certificates of release to service following minor scheduled line maintenance and simple defect rectification within the limits of tasks specifically endorsed on the certification authorization referred to in point 145.A.35 of Annex II (Part 145). The certification privileges shall be restricted to work that the license holder has personally performed in the maintenance organization that issued the certification authorization.

A category B1 aircraft maintenance license shall permit the holder to issue certificates of release to service and to act as B1 support staff following:

- Maintenance performed on aircraft structure, powerplant and mechanical and electrical systems.
- Work on avionic systems requiring only simple tests to prove their serviceability and not requiring troubleshooting.

A category B2 aircraft maintenance license shall permit the holder to issue certificates of release to service and to act as B2 support staff for the following:

- Maintenance on avionic and electrical systems.
- Electrical and avionics tasks within powerplant and mechanical systems, requiring only simple tests to prove their serviceability.
- Minor scheduled line maintenance and simple defect rectification within the limits of tasks specifically endorsed on the certification authorization referred to in point 145.A.35 of Annex II (Part 145). This certification privilege shall be restricted to work that the license holder has personally performed in the maintenance organization which issued the certification authorization and limited to the ratings already endorsed in the B2 license.

A category B3 aircraft maintenance license shall permit the holder to issue certificates of release to service and to act as B3 support staff for:

- Maintenance performed on airplane structure, power plant and mechanical and electrical systems.
- Work on avionic systems requiring only simple tests to prove their serviceability and not requiring troubleshooting.

The category B3 license does not include any A subcategories. Nevertheless, this does not prevent the B3 license holder from releasing maintenance tasks typical of the A1.2 subcategory for piston engine non-pressurized aeroplanes of 2 000 kg MTOM and below, within the limitations of the B3 license.

A category C aircraft maintenance license shall permit the holder to issue certificates of release to service following base maintenance on aircraft. The privileges apply to the aircraft in its entirety. The category C license permits certification of scheduled base maintenance by the issue of a single certificate of release to service for the complete aircraft after the completion of all such maintenance. The basis for this certification is that the maintenance has been carried out by competent mechanics and category B1, B2 and B3 support staff, as appropriate, and have signed for the maintenance tasks under their respective specialization. The principal function of the category C certifying staff is to ensure that all required maintenance has been called up and signed off by the category B1, B2 and B3 support staff, as appropriate, before issue of the certificate of release to service.

Only category C personnel who also hold category B1, B2 or B3 qualifications may perform both roles in base maintenance.

REQUIREMENTS FOR EXERCISING PRIVILEGES

The holder of an aircraft maintenance license may not exercise its privileges unless:

a. In compliance with the applicable requirements of Annex I (Part M) and Annex II (Part 145);
b. In the preceding two year period he/she has either had six months of maintenance experience in accordance with the privileges granted by the aircraft maintenance license or met the provision for the issue of the appropriate privileges;
c. He/she has the adequate competence to certify maintenance on the corresponding aircraft;
d. He/she is able to read, write and communicate to an understandable level in the language(s) in which the technical documentation and procedures necessary to support the issue of the certificate of release to service are written.

DEFINITIONS FOR EXERCISING PRIVILEGES

Electrical system: the aircraft electrical power supply source, plus the distribution system to the different components contained in the aircraft and relevant connectors. Lighting systems are also included in this definition. When working on cables and connectors which are part of these electrical systems, the following typical practices are included in the privileges:

1. Continuity, insulation and bonding techniques and testing.
2. Crimping and testing of crimped joints.
3. Connector pin removal and insertion.
4. Wiring protection techniques.

Instruments are formally included within the privileges of the B2 license holders. However, maintenance on electromechanical and pitot-static components may also be released by a B1 license holder.

Aircraft maintained in accordance with the "progressive" type programs need to be individually assessed in relation to this paragraph. In principle, the decision to allow some "progressive" checks to be carried out is determined by the assessment that all tasks within the particular check can be carried out safely to the required standards at the designated line maintenance station.

BASIC KNOWLEDGE REQUIREMENTS

a. An applicant for an aircraft maintenance license, or the addition of a category or subcategory to such a license, shall demonstrate by examination a level of knowledge in the appropriate subject modules in accordance with the Appendix I to Annex III (Part 66). The examination shall be conducted either by a training organization appropriately approved in accordance with Annex IV (Part 147) or by the competent authority.

b. The training courses and examinations shall be passed within 10 years prior to the application for an aircraft maintenance license or the addition of a category or subcategory to such aircraft maintenance license. Should this not be the case, examination credits may however be obtained in accordance with point (c).

c. The applicant may apply to the competent authority for full or partial examination credit to the basic knowledge requirements for:
   - Basic knowledge examinations that do not meet the requirement described in point (b) above, and
   - Any other technical qualification considered by the competent authority to be equivalent to the knowledge standard of Annex III (Part 66).

Credits shall be granted in accordance with Subpart E of Section B of this Annex (Part 66).

d. Credits expire 10 years after they are granted to the applicant by the competent authority. The applicant may apply for new credits after expiration.

BASIC EXPERIENCE REQUIREMENTS

An applicant for an aircraft maintenance license shall have acquired the following:

For category A, subcategories B1.2, B1.4, and B3:
- Three years of practical maintenance experience on operating aircraft, if the applicant has no previous relevant technical training; or
- Two years of practical maintenance experience on operating aircraft and completion of training considered relevant by the competent authority as a skilled worker, in a technical trade; or
- One year of practical maintenance experience on operating aircraft and completion of a basic training course approved in accordance with Annex IV (Part 147).

For category B2 and subcategories B1.1 and B1.3:
- Five years of practical maintenance experience on operating aircraft if the applicant has no previous relevant technical training; or
- Three years of practical maintenance experience on operating aircraft and completion of training considered relevant by the competent authority as a skilled worker, in a technical trade; or
- Two years of practical maintenance experience on operating aircraft and completion of a basic training course approved in accordance with Annex IV (Part 147).

For category C with respect to large aircraft:
- Three years of experience exercising category B1.1, B1.3 or B2 privileges on large aircraft or as support staff according to point 145.A.35, or, a combination of both; or
- Five years of experience exercising category B1.2 or B1.4 privileges on large aircraft or as support staff according to point 145.A.35, or a combination of both.

For category C with respect to other than large aircraft:
- Three years of experience exercising category B1 or B2 privileges on other than large aircraft or as support staff according to point 145.A.35(a), or a combination of both.

For category C obtained through the academic route:
- An applicant holding an academic degree in a technical discipline, from a university or other higher educational institution recognized by the competent authority, three years of experience working in a civil aircraft maintenance environment on a representative selection of tasks directly associated with aircraft maintenance including 6 months of observation of base maintenance tasks.

LICENSE EXTENSION

An applicant for an extension to an aircraft maintenance license shall have a minimum of civil aircraft maintenance experience requirement that is appropriate to the additional category or subcategory of license applied for as defined in Appendix IV to this Annex (Part 66). The experience shall be practical and involve a representative cross section of maintenance tasks on aircraft. At least 1 year of the required experience shall be recent maintenance experience on aircraft of the category/subcategory for which the initial aircraft maintenance license is sought.

For subsequent category/subcategory additions to an existing aircraft maintenance license, the additional recent maintenance experience required may be less than one year, but shall be at least three months. The required experience shall be dependent upon the difference between the license category/subcategory held and applied for. Such additional experience shall be typical of the new license category/subcategory sought. [**Figure 2-4**]

ALTERNATE EXPERIENCE

Notwithstanding paragraph (a), aircraft maintenance experience gained outside a civil aircraft maintenance environment shall be accepted when such maintenance is equivalent to that required by this Annex (Part 66) as established by the competent authority. Additional experience of civil aircraft maintenance shall, however, be required to ensure adequate understanding of the civil aircraft maintenance environment. Experience shall have been acquired within the 10 years preceding the application for an aircraft maintenance license or the addition of a category or subcategory to such a license.

CONTINUED VALIDITY OF THE AIRCRAFT MAINTENANCE LICENSE

The aircraft maintenance license becomes invalid five years after its last issue or change, unless the holder submits his/her aircraft maintenance license to the competent authority that issued it, in order to verify that the information contained in the license is the same as that contained in the competent authority records, pursuant to point 66.B.120.

The holder of an aircraft maintenance license shall complete the relevant parts of EASA Form 19 (Appendix V) and submit it with the holder's copy of the license to the competent authority that issued the original aircraft maintenance license, unless the holder works in a maintenance organization approved in accordance with

To From	A1	A2	A3	A4	B1.1	B1.2	B1.3	B1.4	B2	B2L	B3
A1	-	6 Months	6 Months	6 Months	2 Years	6 Months	2 Years	1 Year	2 Years	1 Year	6 Months
A2	6 Months	-	6 Months	6 Months	2 Years	6 Months	2 Years	1 Year	2 Years	1 Year	6 Months
A3	6 Months	6 Months	-	6 Months	2 Years	1 Year	2 Years	6 Months	2 Years	1 Year	1 Year
A4	6 Months	6 Months	6 Months	-	2 Years	1 Year	2 Years	6 Months	2 Years	1 Year	1 Year
B1.1	None	6 Months	6 Months	6 Months	-	6 Months	6 Months	6 Months	1 Year	1 Year	6 Months
B1.2	6 Months	None	6 Months	6 Months	2 Years	-	2 Years	6 Months	2 Years	1 Year	None
B1.3	6 Months	6 Months	None	6 Months	6 Months	6 Months	-	6 Months	1 Year	1 Year	6 Months
B1.4	6 Months	6 Months	6 Months	None	2 Years	6 Months	1 Year	-	2 Years	-	6 Months
B2	6 Months	6 Months	6 Months	6 Months	1 Year	1 Year	1 Year	1 Year	-	-	1 Year
B2L	6 Months	6 Months	6 Months	6 Months	1 Year	1 Year	1 Year	1 Year	1 Year	1 Year	1 Year
B3	6 Months	None	6 Months	6 Months	2 Years	6 Months	2 Years	1 Year	2 Years	1 Year	-

Figure 2-4. Part-66C Appendix IV table showing experience requirements for license extensions.

Annex II (Part 145) that has a procedure in its exposition whereby such organization may submit the necessary documentation on behalf of the aircraft maintenance license holder.

Any certification privilege based upon an aircraft maintenance license becomes invalid as soon as the aircraft maintenance license is invalid. The aircraft maintenance license is only valid when issued and/or changed by the competent authority and when the holder has signed the document.

AIRCRAFT RATING REQUIREMENTS

The following chart gives per aircraft group the requirements to endorse a type rating for each category of license. [**Figure 2-5**]

LIMITATIONS

Limitations introduced on an aircraft maintenance license are exclusions from the certification privileges and affect the aircraft in its entirety. For limitations referred to in point 66.A.45, limitations shall be removed upon:

1. Demonstration of appropriate experience;
2. After a satisfactory practical assessment performed by the competent authority.

For limitations referred to in point 66.A.70, limitations shall be removed upon satisfactory completion of examination on those modules/subjects defined in the applicable conversion report referred to in point 66.B.300.

EVIDENCE OF QUALIFICATION

Personnel exercising certification privileges as well as support staff shall produce their license, as evidence of qualification, within 24 hours upon request by an authorized person.

INFORMATION IN PART 66 APPENDICES

A few other areas of concern related to the EASA aircraft maintenance professional are located in the Part 66 appendices. Basic examination standards are listed in Appendix II. This includes the number of questions per each module examination and the time allotted to take each exam. Appendix III defines the aircraft type training requirements and the associated examination standards. Appendix IV specifies experience requirements for Part 66 license extensions. **Figure 2-4** is taken from Appendix IV. It shows the experience requirements for adding a new category or subcategory to an existing Part 66 license. The experience shall be practical maintenance experience on operating aircraft in the subcategory relevant to the application. Note that the experience requirement will be reduced by 50% if the applicant has completed an approved Part 147 course relevant to the subcategory.

Aircraft Rating Requirements

Aircraft	B1/B3/L license	B2/B2L license	C license
Group 1 Aircraft, except Airships - Complex motor-powered aircraft. - Multiple engine helicopters. - Aeroplanes certified above FL290. - Aircraft equipped with fly-by-wire. - Other aircraft when defined by the Agency.	(For B1) Individual TYPE RATING Type training: - Theory + examination - Practical + assessment PLUS: OJT (for first aircraft in license subcategory)	(For B2) Individual TYPE RATING Type training: - Theory + examination - Practical + assessment PLUS: OJT (for first aircraft in license subcategory)	Individual TYPE RATING Type training: - Theory + examination
Group 1 Airships	(For L5 license) Individual TYPE RATING Type training: - Theory + examination - Practical + assessment PLUS: OJT (for first aircraft in license subcategory)	(For B2) Individual TYPE RATING Type training: - Theory + examination - Practical + assessment PLUS: OJT (for first aircraft in license category)	Not applicable
Group 2 Aircraft Subgroups: 2a: Single turboprop aeroplanes (*) 2b: Single turbine engine helicopters (*) 2c: Single piston engine helicopters (*) (*) Except those classified in Group 1.	(For B1.1, B1.3, B1.4) Individual TYPE RATING (type training + OJT) or (type examination + practical experience) Full SUBGROUP RATING (type training + OJT) or (type examination + practical experience) on at least 3 aircraft representative of that subgroup Manufacturer SUBGROUP RATING (type training + OJT) or (type examination + practical experience) on at least 2 aircraft representative of that manufacturer subgroup	(For B2) Individual TYPE RATING (type training + OJT) or (type examination + practical experience) (For B2 and B2L) Full SUBGROUP RATING based on demonstration of practical experience Manufacturer SUBGROUP RATING based on demonstration of practical experience	Individual TYPE RATING type training or type examination Full SUBGROUP RATING type training or type examination on at least 3 aircraft representative of that subgroup Manufacturer SUBGROUP RATING type training or type examination on at least 2 aircraft representative of that manufacturer subgroup
Group 3 Aircraft Piston-engine Aeroplanes (except those classified in Group 1)	(For B1.2) Individual TYPE RATING (type training + OJT) or (type examination + practical experience) Full GROUP 3 RATING based on demonstration of practical experience Limitations: - Pressurized Aeroplanes - Metal Aeroplanes - Composite Aeroplanes - Wooden Aeroplanes - Metal tubing & Fabric Aeroplanes	(For B2) Individual TYPE RATING (type training + OJT) or (type examination + practical experience) (For B2 and B2L) Full GROUP 3 RATING based on demonstration of appropriate experience	Individual TYPE RATING type training or type examination Full GROUP 3 RATING based on demonstration of practical experience
Piston-engine non-pressurized Aeroplanes of 2 000 kg MTOM and below	(For B3) FULL RATING "Piston-engine non-pressurized aeroplanes of 2 000 kg MTOM and below" based on demonstration of practical experience Limitations: - Metal Aeroplanes - Composite Aeroplanes - Wooden Aeroplanes - Metal tubing & Fabric Aeroplanes	This rating cannot be endorsed on a B2/B2L license. These aircraft are already covered by the endorsement of ratings for Group 3 aircraft (see box above)	This rating cannot be endorsed on a C license. These aircraft are already covered by the endorsement of ratings for Group 3 aircraft (see box above)
Group 4 Aircraft: Sailplanes, Powered Sailplanes, Balloons and Airships other than those in Group 1	(For all L subcategories, except L5) – For L1C: 'composite sailplanes' rating, – For L1: 'sailplanes' rating, – For L2C: 'composite powered sailplanes and composite ELA1 aeroplanes' rating, – For L2: 'powered sailplanes and ELA1 aeroplanes' rating, – For L3H: 'hot-air balloons' rating, – For L3G: 'gas balloons' rating, – For L4H: 'hot-air airships' rating, – For L4G: 'ELA2 gas airships' rating, all based on demonstration of practical experience Limitations: see 66.A.45(h)	(For B2 and B2L) Full GROUP 4 RATING based on demonstration of practical experience	Not Applicable

Figure 2-5. The following chart gives per aircraft group the requirements to endorse a type rating for each category of license.

I.

EUROPEAN UNION (*)

[STATE]

[AUTHORITY NAME & LOGO]

II.

Part-66

AIRCRAFT MAINTENANCE LICENCE

III.

Licence No [MEMBER STATE CODE].66.[XXXX]

EASA FORM 26 Issue 3

Form 2-1A. A Part-66 aircraft maintenance license (page 1).

IVa. Full name of holder:
IVb. Date and place of birth:
V. Address of holder:
VI. Nationality of holder:
VII. Signature of holder:
III. Licence No:

Form 2-1B. A Part-66 aircraft maintenance license (page 2).

VIII. CONDITIONS:

This licence shall be signed by the holder and be accompanied by an identity document containing a photograph of the licence holder.

Endorsement of any categories on the page(s) entitled Part-66 CATEGORIES only, does not permit the holder to issue a certificate of release to service for an aircraft.

This licence when endorsed with an aircraft rating meets the intent of ICAO annex 1.

The privileges of the holder of this licence are prescribed by Regulation (EC) No 2042/2003 and in particular its Annex III (Part-66).

This licence remains valid until the date specified on the limitation page unless previously suspended or revoked.

The privileges of this licence may not be exercised unless in the preceding two year period the holder has had either six months of maintenance experience in accordance with the privileges granted by the licence, or met the provision for the issue of the appropriate privileges.

III. Licence No:

Form 2-1C. A Part-66 aircraft maintenance license (page 3).

IX. Part-66 CATEGORIES							
VALIDITY	A	B1	B2	B2L	B3	L	C
Aeroplanes Turbine			N/A		N/A	N/A	N/A
Aeroplanes Piston			N/A		N/A	N/A	N/A
Helicopters Turbine			N/A		N/A	N/A	N/A
Helicopters Piston			N/A		N/A	N/A	N/A
Avionics	N/A	N/A			N/A	N/A	N/A
Complex Motor Powered Aircraft	N/A	N/A	N/A		N/A	N/A	
Aircraft Other Than Complex Motor Powered Aircraft	N/A	N/A	N/A		N/A	N/A	
Sailplanes, Powered Sailplanes, ELA1 Aeroplanes, Balloons and Airships	N/A	N/A	N/A		N/A		N/A
Piston Engine Non-Pressurized Aeroplanes of 2 000 kg MTOM and below	N/A	N/A	N/A			N/A	N/A

X. Signature of issuing officer & date:

XI. Seal or stamp of issuing Authority:

III. Licence No:

Form 2-1D. A Part-66 aircraft maintenance license (page 4).

APPLICATION FOR INITIAL/AMENDMENT/RENEWAL OF PART-66 AIRCRAFT MAINTENANCE LICENCE (AML)	EASA FORM 19

APPLICANT'S DETAILS:

Name: ……

Address: ……

Tel: …….. E-mail: ……

Nationality: …….. Date and Place of Birth: ……

PART-66 AML DETAILS (if applicable):

Licence No: …… Date of Issue: ……

EMPLOYER'S DETAILS:

Name: ……

Address: ……

……

Maintenance Organisation Approval Reference: ……

Tel: …….. Fax: ……

APPLICATION FOR: (Tick relevant boxes)

Initial AML ☐ Amendment of AML ☐ Renewal of AML ☐

(Sub)categories	**A**	**B1**	**B2**	**B2L**	**B3**	**C**	**L (see below)**
Aeroplane Turbine	☐	☐					
Aeroplane Piston	☐	☐					
Helicopter Turbine	☐	☐					
Helicopter Piston	☐	☐					
Avionics			☐	☐ See system ratings below			
Piston engine non-pressurised aeroplanes of MTOM of 2t and below					☐		
Complex motor-powered aircraft						☐	
Aircraft other than complex motor-powered aircraft						☐	

System ratings for B2L licence:

1. autoflight ☐
2. instruments ☐
3. com/nav ☐
4. surveillance ☐
5. airframe systems ☐

L-licence subcategories: ☐

L1C: Composite sailplanes ☐

L1: Sailplanes ☐

L2C: Composite powered sailplanes and composite ELA1 aeroplanes ☐

L2: Powered sailplanes and ELA1 aeroplanes ☐

L3H: Hot-air balloons ☐

L3G: Gas balloons ☐

L4H: Gas balloons ☐

L4H: Hot-air airships ☐

L4G: ELA2 gas airships ☐

L5: Gas airship other than ELA2 ☐

Type endorsements/Rating endorsement/Limitation removal (if applicable):

……

EASA Form 19 Issue 5

Form 2-2A. Form 19 application for an aircraft maintenance license (AML).

I wish to apply for initial/amendment of/renewal of Part-66 AML, as indicated, and confirm that the information contained in this form was correct at the time of application.

I herewith confirm that:

1. I am not holding any Part-66 AML issued in another Member State;
2. I have not applied for any Part-66 AML in another Member State; and
3. I never had a Part-66 AML issued in another Member State which was revoked or suspended in any other Member State.

I also understand that any incorrect information could disqualify me from holding a Part-66 AML.

Signed: …… Name: ……

Date: ……

I wish to claim the following credits (if applicable):

……

……

……

Experience credits for Part-147 training

……

……

……

Examination credits for equivalent exam certificates

……

……

……

Please enclose all relevant certificates

Recommendation (if applicable): It is hereby certified that the applicant has met the relevant Part-66 maintenance knowledge and experience requirements and it is recommended that the competent authority grants or endorses the Part-66 AML.

Signed: ..... Name: .....

Position: ..... Date: .....

EASA Form 19 Issue 5

Form 2-2B. Form 19 application for an Aircraft Maintenance License (AML).

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Question 2-1
What privilege is given upon fulfilling the relevant requirements of Part 66?

Question 2-2
What is the primary duties of category C certifying staff?

Question 2-3
What privilege is given to the holder of a B1.3 license?

Question 2-4
What are examples of Group 4 aircraft?

Question 2-5
Upon completing all requirements of Part 66, to whom does an applicant apply for an aircraft maintenance license?

Question 2-6
What is the basic restriction on a B1 license holder regarding work on avionics systems?

Question 2-7
What are the experience requirements to apply for a B1.1 license following successful training at an EASA approved Part 147 organization?

Question 2-8
For which group(s) of aircraft is a type rating required for that aircraft?

SUBMODULE 2 PRACTICE ANSWERS

Answer 2-1
The issuance of certificates of release to service.

Answer 2-2
To insure all base maintenance work has been properly carried out and issue the final certificate of release to service.

Answer 2-3
To issue a release to service following line maintenance of a turbine powered helicopter.

Answer 2-4
Sailplanes, balloons and airships not otherwise categorized as Group 1.

Answer 2-5
To an EASA member state national authority.

Answer 2-6
Only simple tests may be performed which do not require troubleshooting.

Answer 2-7
Two years of practical experience working on operating aircraft.

Answer 2-8
Group 1, 2, and 3 aircraft require an additional type rating.

Approved Maintenance Organizations

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		A1
10.3	**Approved Maintenance Organizations** General understanding of Part-145 and Part-CAO.	2

10.3 - APPROVED MAINTENANCE ORGANIZATIONS

DEFINITIONS IMPORTANT FOR THIS SUBMODULE

An aircraft can be used for commercial air transport when operated under an approved air operator's certificate; and whose maintenance is performed by an approved Part 145 organization; when Certificates of Release to Service (CRS) are issued by approved certifying staff. Airlines or air transport operators, are approved to operate a fleet of aircraft. The maintenance on the fleet is performed either in-house or by an external organization.

Aeroplane/Airplane	An engine-driven fixed-wing aircraft heavier than air that is supported in flight by the dynamic reaction of the air against its wings.
Aircraft	Any machine that can derive support in the atmosphere from the reactions of the air other than reactions of the air against the earth's surface.
Airframe	The fuselage, booms, nacelles, cowlings, fairings, airfoil surfaces (including rotors but excluding propellers and rotating airfoils of engines), and landing gear of an aircraft and their accessories and controls.
Base Maintenance	Maintenance tasks falling outside above "Line" criteria are considered to be Base Maintenance.
Certifying Staff	Personnel responsible for the release of an aircraft or a component after maintenance.
Component	Any engine, propeller, part or appliance.
Continuing Airworthiness	All of the processes ensuring that, at any time in its operating life, the aircraft complies with the airworthiness requirements in force and is in a condition for safe operation.
Critical Maintenance Task	Maintenance task that involves the assembly or any disturbance of a system or any part on an aircraft, engine or propeller that, if an error occurred during its performance, could directly endanger the flight safety.
Helicopter	A rotorcraft that, for its horizontal motion, depends principally on its engine-driven rotors.
Line Maintenance	May include: Trouble shooting; Defect rectification; Component replacement with use of external test equipment if required. Component replacement may include components such as engines and propellers; Scheduled maintenance and/or checks including visual inspections that will detect obvious unsatisfactory conditions/discrepancies but do not require extensive in-depth inspection. It may also include internal structure, systems and powerplant items which are visible through quick opening access panels/doors; Minor repairs and modifications which do not require extensive disassembly and can be accomplished by simple means.
Maintenance	Means any one or combination of the following activities: overhaul, repair, inspection, replacement, modification or defect rectification of an aircraft or component, with the exception of preflight inspection.
Organization	A natural person, a legal person or part of a legal person. Such an organization may be established at more than one location whether or not within the territory of the Member States.
Preflight Inspection	Means the inspection carried out before flight to ensure that the aircraft is fit for the intended flight. No Release to Service required, no Certifying staff to perform the task, only Pilots in Commands.
Propeller	A complete propeller including all parts attached to and rotating with the hub and blades, and all equipment required for the control and operation of the propeller.

PART 145

The European regulations in Part 145 related to maintenance organizations highlight the following:

1. There is a clear distinction between the responsibilities of a maintenance organization (Part 145) and an operator (air operations).
2. A maintenance organization must create and file with EASA a Maintenance Organization Exposition (MOE) that contains information specifying the scope of work performed and that shows how the organization intends to comply with this Part.
3. The crucial role of quality assurance to guarantee, with respect to the authority, conformity with EASA requirements in accordance with the MOE.
4. The importance of the CRS which is a transfer of the aircraft from the maintenance organization to the operators.

PART 145 – MAINTENANCE ORGANIZATION REQUIREMENTS

The EASA Part 145 Regulation establishes common technical requirements and administrative procedures for ensuring the continuing airworthiness of aircraft, including any component for installation, which are:

- Registered in a member state;
- Registered in a third country and used by an operator for which a member state ensures oversight of operations.

GENERAL

For the purpose of this Part, the competent authority shall be:

- For organizations having their principal place of business in a member state, the authority designated by that member state;
- For organizations having their principal place of business located in a third country, the Agency.

SCOPE

This section establishes the requirements that are to be met by an organization to qualify for the issue or continuation of an approval for the maintenance of aircraft and components.

APPLICATION

An application for the issue or change of an approval shall be made to the competent authority in a form and manner established by such authority.

TERMS OF APPROVAL

The organization shall specify the scope of work deemed necessary to constitute approval (Appendix IV to Annex I (Part M); and contains a table of all classes/ratings).

- *Category A*—class rating means that the approved maintenance organization may carry out maintenance on the aircraft and any component (including engines and/or auxiliary power units.
- *Category B*—class rating means that the approved maintenance organization may carry out maintenance on the uninstalled engine and/or APU and engine and/or APU components.
- *Category C*—class rating means that the approved maintenance organization may carry out the maintenance on uninstalled components (excluding engines and APUs) intended for fitment to the aircraft or engine/APU.
- *Category D*—class rating is a self contained class rating not necessarily related to a specific aircraft, engine or other component. The D1 Non-Destructive Testing (NDT) rating is only necessary for an approved maintenance organization that carries out NDT as a particular task for another organization.

FACILITY REQUIREMENTS

The organization shall ensure that:

a. Facilities are provided appropriate for all planned work, ensuring in particular, protection from the weather elements. Specialized workshops and bays are segregated as appropriate to ensure that environmental and work area contamination is unlikely to occur.
   1. For base maintenance of aircraft, aircraft hangars are both available and large enough to accommodate aircraft on planned base maintenance;
   2. For component maintenance, component workshops are large enough to accommodate the components on planned maintenance.

b. Office accommodation is provided for the management of the planned work referred to in point (a), and certifying staff so that they can carry out their designated tasks in a manner that contributes to good aircraft maintenance standards.

c. The working environment including aircraft hangars, component workshops and office accommodation is appropriate for the task carried out and in particular special requirements observed. Unless otherwise dictated by the particular task environment, the working environment must be such that the effectiveness of personnel is not impaired.
   1. Temperatures must be maintained such that personnel can carry out required tasks without undue discomfort.
   2. Dust and any other airborne contamination are kept to a minimum and not be permitted to reach a level in the work task area where visible aircraft/component surface contamination is evident. Where dust or other airborne contamination results in visible surface contamination, all susceptible systems are sealed until acceptable conditions are reestablished.
   3. Lighting is such as to ensure each inspection and maintenance task can be carried out in an effective manner.
   4. Noise shall not distract personnel from carrying out inspection tasks. Where it is impractical to control the noise source, such personnel are provided with the necessary personal equipment to stop excessive noise causing distraction during inspection tasks.
   5. Where a particular maintenance task requires the application of specific environmental conditions different to the foregoing, then such conditions are observed. Specific conditions are identified in the maintenance data.
   6. The working environment for line maintenance is such that the particular maintenance or inspection task can

be carried out without undue distraction. Therefore where the working environment deteriorates to an unacceptable level in respect of temperature, moisture, hail, ice, snow, wind, light, dust, or other airborne contamination, the particular maintenance or inspection tasks must be suspended until satisfactory conditions are re-established.

d. Secure storage facilities are provided for components, equipment, tools and material. Storage conditions ensure segregation of serviceable components and material from unserviceable aircraft components, material, equipment and tools. The conditions of storage are in accordance with the manufacturer's instructions to prevent deterioration and damage of stored items. Access to storage facilities is restricted to authorized personnel.

PERSONNEL REQUIREMENTS

Part 145 specifies the roles of key positions in the maintenance organization management hierarchy. A chart illustrating these positions is given in **Figure 3-1**.

a. The organization shall appoint an accountable manager who has corporate authority for ensuring that all maintenance required by the customer can be financed and carried out to the standard required by this Part. The accountable manager shall:
   1. Ensure that all necessary resources are available to accomplish maintenance in accordance with point 145.A.65(b) to support the organization approval.
   2. Establish and promote the safety and quality policy specified in point 145.A.65(a).
   3. Demonstrate a basic understanding of this Annex (Part 145).

b. The organization shall nominate a person or group of persons, whose responsibilities include ensuring that the organization complies with this Part. Such person(s) shall ultimately be responsible to the accountable manager.
   1. The person or persons nominated shall represent the maintenance management structure of the organization and be responsible for all functions specified in this Part.
   2. The person or persons nominated shall be identified and their credentials submitted in a form and manner established by the competent authority.
   3. The person or persons nominated shall be able to demonstrate relevant knowledge, background and satisfactory.
   4. Experience related to aircraft or component maintenance and demonstrate a working knowledge of this Part.
   5. Procedures shall make clear who deputizes for any particular person in the case of lengthy absence of the said person.

c. The accountable manager under point (a) shall appoint a person with responsibility for monitoring the quality system, including the associated feedback system as required by point 145.A.65(c). The appointed person shall have direct access to the accountable manager to ensure that the accountable manager is kept properly informed on quality and compliance matters.

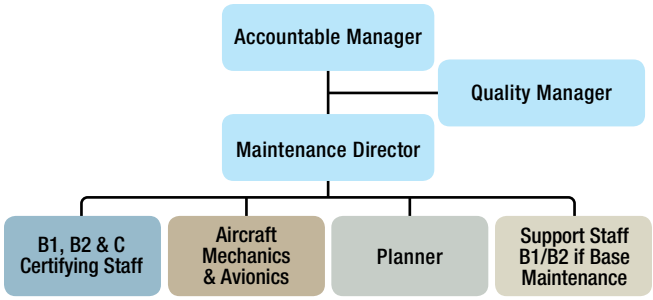

Figure 3-1. Management structure required for Part-145 maintenance operations.

d. The organization shall have a maintenance man-hour plan showing that the organization has sufficient staff to plan, perform, supervise, inspect and quality monitor the organization in accordance with the approval. In addition the organization shall have a procedure to reassess work intended to be carried out when actual staff availability is less than the planned staffing level for any particular work shift or period.

e. The organization shall establish and control the competence of personnel involved in any maintenance, management and/or quality audits in accordance with a procedure and to a standard agreed by the competent authority. In addition to the necessary expertise related to the job function, competence must include an understanding of the application of human factors and human performance issues appropriate to that person's function in the organization. 'Human factors' means 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 of human performance. 'Human performance' means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

f. The organization shall ensure that personnel who carry out and/or control a continued airworthiness non-destructive test of aircraft structures and/or components are appropriately qualified for the particular non-destructive test in accordance with the European or equivalent standard recognized by the Agency. Personnel who carry out any other specialized task shall be appropriately qualified in accordance with officially recognized Standards. By derogation to this point those personnel specified in points (g) and (h)(1) and (h)(2), qualified in category B1 or B3 in accordance with Annex III (Part 66) may carry out and/or control color contrast dye penetrant tests.

g. Any organization maintaining aircraft, except where stated otherwise in point (j), shall in the case of aircraft line maintenance, have appropriate aircraft rated certifying staff qualified as category B1, B2, B3, as appropriate, in accordance with Annex III (Part 66) and point 145.A.35.

In addition such organizations may also use appropriately task trained certifying staff holding the privileges described in points 66.A.20(a)(1) and 66.A.20(a)(3)(ii) and qualified in accordance with Annex III (Part 66) and point 145.A.35 to carry out minor scheduled line maintenance and simple defect rectification. The

availability of such certifying staff shall not replace the need for category B1, B2, B3 certifying staff.

h. Any organization maintaining aircraft, except where stated otherwise in point (j) shall, In the case of base maintenance of large aircraft, have appropriate aircraft type rated certifying staff qualified as category C in accordance with Part 66 and point 145.A.35. In addition the organization shall have sufficient aircraft type rated staff qualified as category B1, B2 as appropriate in accordance with Part 66 and point 145.A.35 to support the category C certifying staff.
   1. B1 and B2 support staff shall ensure that all relevant tasks or inspections have been carried out to the required standard before the category C certifying staff issues the certificate of release to service.
   2. The organization shall maintain a register of any such B1 and B2 support staff.
   3. The category C certifying staff shall ensure that compliance with point (i) has been met and that all work required by the customer has been accomplished during the particular base maintenance check or work package, and shall also assess the impact of any work not carried out with a view to either requiring its accomplishment or agreeing with the operator to defer such work to another specified check or time limit.

In the case of base maintenance of aircraft other than large aircraft have either.
   1. Appropriate aircraft rated certifying staff qualified as category B1, B2, B3, as appropriate, in accordance with Annex III (Part 66) and point 145.A.35;
   2. Appropriate aircraft rated certifying staff qualified in category C assisted by support staff as specified in point 145.A.35(a)(i).

i. Component certifying staff shall comply with Annex III (Part 66).

j. By derogation to points (g) and (h), in relation to the obligation to comply with Annex III (Part 66), the organization may use certifying staff qualified in accordance with the following provisions:

For organization facilities located outside the community territory certifying staff may be qualified in accordance with the national aviation regulations of the State in which the organization facility is registered subject to the conditions specified in Appendix IV to this Part.

For line maintenance carried out at a line station of an organization which is located outside the community territory, the certifying staff may be qualified in accordance with the national aviation regulations of the state in which the line station is based, subject to the conditions specified in Appendix IV to this Part.

For a repetitive preflight airworthiness directive which specifically states that the flight crew may carry out such airworthiness directive, the organization may issue a limited certification authorization to the aircraft commander and the flight engineer on the basis of the flight crew license held. However, the organization shall ensure that sufficient practical training has been carried out to ensure that such aircraft commander or flight engineer can accomplish the airworthiness directive to the required standard.

In the case of aircraft operating away from a supported location the organization may issue a limited certification authorization to the commander and/or the flight engineer on the basis of the flight crew license held subject to being satisfied that sufficient practical training has been carried out to ensure that the commander or flight engineer can accomplish the specified task to the required standard. The provisions of this point shall be detailed in an exposition procedure.

In the following cases, where an aircraft is grounded at a location other than the main base where no appropriate certifying staff are available, the organization contracted to provide maintenance support may issue a one off certification authorization:
   1. To one of its employees holding equivalent type authorizations on aircraft of similar technology, construction and systems; or
   2. To any person with not less than five years maintenance experience and holding a valid ICAO aircraft maintenance license rated for the aircraft type requiring certification provided there is no organization appropriately approved under this Part at that location and the contracted organization obtains and holds on file evidence of the experience and the license of that person.

All such cases as specified in this point shall be reported to the competent authority within seven days of the issuance of such certification authorization. The organization issuing the one off authorization shall ensure that any such maintenance that could affect flight safety is rechecked by an appropriately approved organization.

CERTIFYING STAFF SND CATEGORY B1 AND B2 SUPPORT STAFF

a. a. In addition to the appropriate requirements of points 145.A.30(g) and (h), the organization [**Figure 3-2**] shall ensure that certifying staff and support staff have an adequate understanding of the relevant aircraft and/or components to be maintained together with the associated organization procedures. In the case of certifying staff, this shall be accomplished before the issue or re-issue of the certification authorization.
   1. 'Support staff" means those staff holding an aircraft maintenance license under Annex III (Part 66) in category B1, B2 and/or B3 with the appropriate aircraft ratings, working in a base maintenance environment while not necessarily holding certification privileges.
   2. 'Relevant aircraft and/or components', means those aircraft or components specified in the particular certification authorization.
   3. Certification authorization' means the authorization issued to certifying staff by the organization and which specifies the fact that they may sign certificates of release to service within the limitations stated in such authorization on behalf of the approved organization.

b. Excepting those cases listed in points 145.A.30(j) and

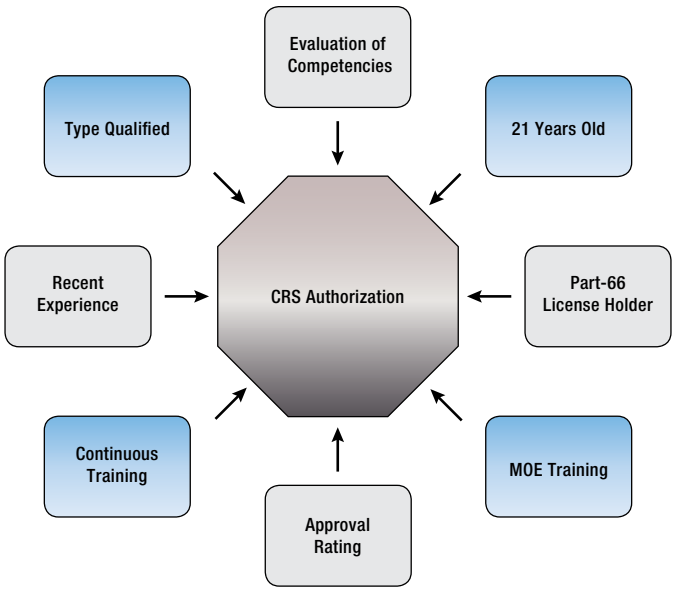

Figure 3-2. Quality system responsibilities.

66.A.20(a)3(ii) the organization may only issue a certification authorization to certifying staff in relation to the basic categories or subcategories and any type rating listed on the aircraft maintenance license as required by Annex III (Part 66), subject to the license remaining valid throughout the validity period of the authorization and the certifying staff remaining in compliance with Annex III (Part 66).

c. The organization shall ensure that all certifying staff and support staff are involved in at least six months of actual relevant aircraft or component maintenance experience in any consecutive two year period. For the purpose of this point 'involved in actual relevant aircraft or component maintenance' means that the person has worked in an aircraft or component maintenance environment and has either exercised the privileges of the certification authorization and/or has actually carried out maintenance on at least some of the aircraft type or aircraft group systems specified in the particular certification authorization.
d. The organization shall ensure that all certifying staff and support staff receive sufficient continuation training in each two year period to ensure that such staff have up to date knowledge of relevant technology, organization procedures and human factor issues.
e. The organization shall establish a program for continuation training for certifying staff and support staff, including a procedure to ensure compliance with the relevant points of 145.A.35 as the basis for issuing certification authorizations under this Part to certifying staff, and a procedure to ensure compliance with Annex III (Part 66).
f. Except where any of the unforeseen cases of point 145.A.30(j)(5) apply, the organization shall assess all prospective certifying staff for their competence, qualification and capability to carry out their intended certifying duties in accordance with a procedure as specified in the exposition prior to the issue or reissue of a certification authorization under this Part.
g. When the conditions of points (a), (b), (d), (f) and, where applicable, point (c) have been fulfilled by the certifying staff, the organization shall issue a certification authorization that clearly specifies the scope and limits of such authorization. Continued validity of the certification authorization is dependent upon continued compliance with points (a), (b), (d), and where applicable, (c).
h. The certification authorization must be in a style that makes its scope clear to the certifying staff and any authorized person who may require to examine the authorization. Where codes are used to define scope, the organization shall make a code translation readily available. 'Authorized person' means the officials of the competent authorities, the Agency and the member state who has responsibility for the oversight of the maintained aircraft or component.
i. The person responsible for the quality system shall also remain responsible on behalf of the organization for issuing certification authorizations to certifying staff. Such person may nominate other persons to actually issue or revoke the certification authorizations in accordance with a procedure as specified in the exposition.
j. The organization shall maintain a record of all certifying staff and support staff, shall contain:
   1. The details of any aircraft maintenance license held under Annex III (Part 66).
   2. All relevant training completed.
   3. The scope of the certification authorizations issued, where relevant.
   4. Particulars of staff with limited or one-off certification authorizations. The organization shall retain the record for at least three years after the staff referred to in this point have ceased employment with the organization or as soon as the authorization has been withdrawn. In addition, upon request, the maintenance organization shall furnish the staff referred to in this point with a copy of their personal record on leaving the organization. The staff referred to in this point shall be given access on request to their personal records as detailed above.
k. The organization shall provide certifying staff with a copy of their certification authorization in either a documented or electronic format.
l. Certifying staff shall produce their certification authorization to any authorized person within 24 hours.
m. The minimum age for certifying staff and support staff is 21 years.
n. The holder of a category A aircraft maintenance license may only exercise certification privileges on a specific aircraft type following the satisfactory completion of the relevant category A aircraft task training carried out by an organization appropriately approved in accordance with Annex II (Part 145) or Annex IV (Part 147). This training shall include practical hands on training and theoretical training as appropriate for each task authorized. Satisfactory completion of training shall be demonstrated by an examination or by workplace assessment carried out by the organization.
o. The holder of a category B2 aircraft maintenance license

may only exercise the certification privileges described in point 66.A.20(a)(3)(ii) of Annex III (Part 66) following the satisfactory completion of:

- The relevant category A aircraft task training; and
- 6 months of documented practical experience covering the scope of the authorization that will be issued. The task training shall include practical hands on training and theoretical training as appropriate for each task authorized. Satisfactory completion of training shall be demonstrated by an examination or by workplace assessment. Task training and examination/assessment shall be carried out by the maintenance organization issuing the certifying staff authorization. The practical experience shall be also obtained within such maintenance organization.

EQUIPMENT, TOOLS AND MATERIAL

a. The organization shall have available and use the necessary equipment, tools and material to perform the approved scope of work.
   1. Where the manufacturer specifies a particular tool or equipment, the organization shall use that tool or equipment, unless the use of alternative tooling or equipment is agreed by the competent authority via procedures specified in the exposition.
   2. Equipment and tools must be permanently available, except in the case of any tool or equipment that is so infrequently used that its permanent availability is not necessary. Cases shall be detailed in an exposition procedure.
   3. An organization approved for base maintenance shall have sufficient aircraft access equipment and inspection platforms and docking such that the aircraft can be properly inspected.

b. The organization shall ensure that all tools, equipment and particularly test equipment are controlled and calibrated according to an officially recognized standard at a frequency to ensure serviceability and accuracy. Records of such calibrations and traceability to the standard used shall be kept by the organization. [**Figure 3-3**]

Figure 3-3. The necessary equipment and tools must be permanently available.

ACCEPTANCE OF COMPONENTS

a. All components shall be classified and appropriately segregated into the following categories:
   1. Components which are in a satisfactory condition, released on an EASA Form 1 or equivalent and marked in accordance with Subpart Q of Annex I (Part 21) to Regulation EU 748/2012.
   2. Unserviceable components which shall be maintained in accordance with this section.
   3. Unsalvageable components which are classified in accordance with point 145.A.42(d).
   4. Standard parts used on an aircraft, engine, propeller or other aircraft component when specified in the manufacturer's illustrated parts catalogue and/or the maintenance data.
   5. Material both raw and consumable used in the course of maintenance when the organization is satisfied that the material meets the required specification and has appropriate traceability. All material must be accompanied by documentation clearly relating to the particular material and containing a conformity to specification statement plus both the manufacturing and supplier source.
   6. Components referred to in point 21A.307(c) of Annex I (Part 21) to Regulation EU 748/2012.

b. Prior to installation of a component, the organization shall ensure that the particular component is eligible to be fitted when different modification and/or airworthiness directive standards may be applicable.

c. The organization may fabricate a restricted range of parts to be used in the course of undergoing work within its own facilities provided procedures are identified in the exposition.

d. Components which have reached their certified life limit or contain a non-repairable defect shall be classified as unsalvageable and shall not be permitted to re-enter the component supply system unless certified life limits have been extended or a repair solution has been approved according to Annex I (Part 21) to Regulation EU 748/2012.

e. Components referred to in point 21A.307(c) of Annex I (Part 21) to Regulation EU 748/2012 shall only be installed if considered eligible for installation by the aircraft owner in its own aircraft.

MAINTENANCE DATA

a. The organization shall hold and use applicable current maintenance data in the performance of maintenance, including modifications and repairs. 'Applicable' means relevant to any aircraft, component or process specified in the organization's approval class rating schedule and in any associated capability list. In the case of maintenance data provided by an operator or customer, the organization shall hold such data when the work is in progress, with the exception of the need to comply with point 145.A.55(c).

b. For the purposes of this Part, applicable maintenance data shall be any of the following:
   1. Any applicable requirement, procedure, operational directive or information issued by the authority

responsible for the oversight of the aircraft or component.

2. Any applicable airworthiness directive issued by the authority responsible for the oversight of the aircraft or component.
3. Instructions for continuing airworthiness, issued by type certificate holders, supplementary type certificate holders, any other organization required to publish such data by Annex I (Part 21) to Regulation EU 748/2012 and in the case of aircraft or components from third countries the airworthiness data mandated by the authority responsible for the oversight of the aircraft or component.
4. Any applicable standard, such as but not limited to, maintenance standard practices recognized by the Agency as a good standard for maintenance.
5. Any applicable data issued in accordance with point (d).

c. The organization shall establish procedures to ensure that if found, any inaccurate, incomplete or ambiguous procedure, practice, information or maintenance instruction contained in the maintenance data used by maintenance personnel is recorded and notified to the author of the maintenance data.
d. The organization may only modify maintenance instructions in accordance with a procedure specified in the maintenance organization's exposition. With respect to those changes, the organization shall demonstrate that they result in equivalent or improved maintenance standards and shall inform the type certificate holder of such changes. Maintenance instructions for the purposes of this point means instructions on how to carry out the particular maintenance task. This excludes the engineering design of repairs and modifications.
e. The organization shall provide a common work card or worksheet system to be used throughout relevant parts of the organization. In addition, the organization shall either transcribe accurately the maintenance data contained in points (b) and (d) onto such work cards or worksheets or make precise reference to the particular maintenance task or tasks contained in such maintenance data. Work cards and worksheets may be computer generated and held on an electronic database subject to both adequate safeguards against unauthorized alteration and a backup electronic database which shall be updated within 24 hours of any entry made to the main electronic database. Complex maintenance tasks shall be transcribed onto the work cards or worksheets and subdivided into clear stages to ensure a record of the accomplishment of the complete maintenance task. Where the organization provides a maintenance service to an aircraft operator who requires their work card or worksheet system to be used then such work card or worksheet system may be used. In this case, the organization shall establish a procedure to ensure correct completion of the aircraft operators' work cards or worksheets. [**Figure 3-4**]
f. The organization shall ensure that all applicable maintenance data is readily available for use when required by maintenance personnel.
g. The organization shall establish a procedure to ensure

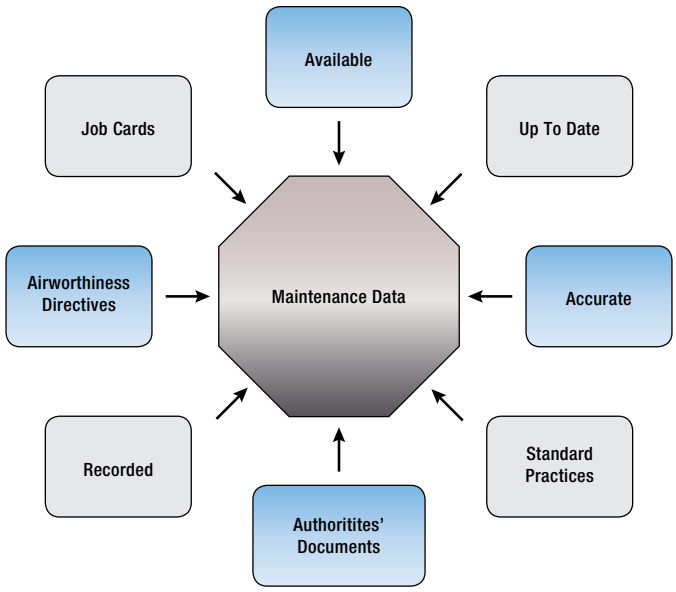

Figure 3-4. Types of maintenance documentation comprising maintenance data.

that maintenance data it controls is kept up to date. In the case of operator/customer controlled and provided maintenance data, the organization shall be able to show that either it has written confirmation from the operator/customer that all such maintenance data is up to date or it has work orders specifying the amendment status of the maintenance data to be used or it can show that it is on the operator/customer maintenance data amendment list.

PRODUCTION PLANNING

a. The organization shall have a system appropriate to the amount and complexity of work to plan the availability of all necessary personnel, tools, equipment, material, maintenance data and facilities in order to ensure the safe completion of the maintenance work.
b. The planning of maintenance tasks, and the organizing of shifts, shall take into account human performance limitations.
c. When it is required to hand over the continuation or completion of maintenance tasks for reasons of a shift or personnel changeover, relevant information shall be adequately communicated between outgoing and incoming personnel.

CERTIFICATION OF MAINTENANCE

a. A certificate of release to service shall be issued by appropriately authorized certifying staff on behalf of the organization when it has been verified that all maintenance ordered has been properly carried out by the organization in accordance with the procedures specified in point 145.A.70, taking into account the availability and use of the maintenance data specified in point 145.A.45, and that there are no non-compliances which are known to endanger flight safety.
b. A certificate of release to service shall be issued before flight at the completion of any maintenance.
c. New defects or incomplete maintenance work orders identified during the above maintenance shall be brought to the attention of the aircraft operator for the specific

purpose of obtaining agreement to rectify such defects or completing the missing elements of the maintenance work order. In the case where the aircraft operator declines to have such maintenance carried out under this point, point (e) is applicable.

d. A certificate of release to service shall be issued at the completion of any maintenance on a component whilst off the aircraft. The authorized release certificate 'EASA Form 1' referred to in Appendix II of Annex I (Part M) constitutes the component certificate of release to service except if otherwise specified in point M.A.502(b) or M.A.502(e). When an organization maintains a component for its own use, an EASA Form 1 may not be necessary depending upon the organization's internal release procedures defined in the exposition.
e. By derogation to point (a), when the organization is unable to complete all maintenance ordered, it may issue a certificate of release to service within the approved aircraft limitations. The organization shall enter such fact in the aircraft certificate of release to service before the issue of such certificate.
f. By derogation to points (a) and 145.A.42, when an aircraft is grounded at a location other than the main line station or main maintenance base due to the non-availability of a component with the appropriate release certificate, it is permissible to temporarily fit a component without the appropriate release certificate for a maximum of 30 flight hours or until the aircraft first returns to the main line station or main maintenance base, whichever is the sooner, subject to the aircraft operator agreement and said component having a suitable release certificate but otherwise in compliance with all applicable maintenance and operational requirements. Such components shall be removed by the above prescribed time limit unless an appropriate release certificate has been obtained in the meantime under points (a) and 145.A.42.

MAINTENANCE RECORDS

a. The organization shall record all details of maintenance work carried out. As a minimum, the organization shall retain records necessary to prove that all requirements have been met for issuance of the certificate of release to service, including subcontractor's release documents.
b. The organization shall provide a copy of each certificate of release to service to the aircraft operator, together with a copy of any specific repair or modification data used for repairs/modifications carried out.
c. The organization shall retain a copy of all detailed maintenance records and any associated maintenance data for three years from the date the aircraft or component to which the work relates was released from the organization.
    1. The records under this point shall be stored in a manner that ensures protection from damage, alteration and theft.
    2. Computer backup discs, tapes etc., shall be stored in a different location from that containing the working discs, tapes etc., in an environment that ensures they remain in good condition.
    3. Where an organization approved under this Annex (Part 145) terminates its operation, all retained maintenance records covering the last two years shall be distributed to the last owner or customer of the respective aircraft or component or shall be stored as specified by the competent authority. [**Figure 3-5**]

OCCURRENCE REPORTING

a. The organization shall report to the competent authority, the state of registry and the organization responsible for the design of the aircraft or component any condition of the aircraft or component identified by the organization that has resulted or may result in an unsafe condition that hazards seriously the flight safety.
b. The organization shall establish an internal occurrence reporting system as detailed in the exposition to enable the collection and evaluation of such reports, including the assessment and extraction of those occurrences to be reported under point (a). This procedure shall identify adverse trends, corrective actions taken or to be taken by the organization to address deficiencies and include evaluation of all known relevant information relating to such occurrences and a method to circulate the information as necessary.
c. The organization shall make such reports in a form and manner established by the Agency and ensure that they contain all pertinent information about the condition and evaluation results known to the organization.
d. Where the organization is contracted by a commercial operator to carry out maintenance, the organization shall also report to the operator any such condition affecting the operator's aircraft or component.
e. The organization shall produce and submit such reports as soon as practicable but in any case within 72 hours of the organization identifying the condition to which the report relates.

SAFETY AND QUALITY POLICY

a. The organization shall establish a safety and quality policy for the organization to be included in the exposition under point 145.A.70.
b. The organization shall establish procedures agreed by the competent authority taking into account human factors and human performance to ensure good maintenance practices and compliance with this Part which shall include a clear work order or contract such that aircraft and components may be released to service in accordance with point 145.A.50.
    1. The maintenance procedures under this point apply to points 145.A.25 to 145.A.95.

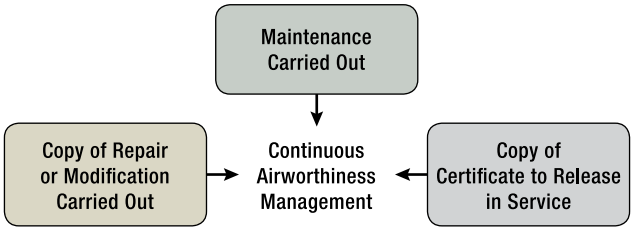

Figure 3-5. Detailed maintenance records are kept for at least two years.

2. The maintenance procedures established or to be established by the organization under this point shall cover all aspects of carrying out the maintenance activity, including the provision and control of specialized services and lay down the standards to which the organization intends to work.
3. With regard to aircraft line and base maintenance, the organization shall establish procedures to minimize the risk of multiple errors and capture errors on critical systems, and to ensure that no person is required to carry out and inspect in relation to a maintenance task involving some element of disassembly/reassembly of several components of the same type fitted to more than one system on the same aircraft during a particular maintenance check. However, when only one person is available to carry out these tasks then the organization's work card or worksheet shall include an additional stage for reinspection of the work by this person after completion of all the same tasks.
4. Maintenance procedures shall be established to ensure that damage is assessed and modifications and repairs are carried out using data specified in point M.A.304.

c. The organization shall establish a quality system that includes the following:
1. Independent audits in order to monitor compliance with required aircraft/aircraft component standards and adequacy of the procedures to ensure that such procedures invoke good maintenance practices and airworthy aircraft/aircraft components. In the smallest organizations the independent audit part of the quality system may be contracted to another organization approved under this Part or a person with appropriate technical knowledge and proven satisfactory audit experience; and
2. A quality feedback reporting system to the person or group of persons specified in point 145.A.30(b) and ultimately to the accountable manager that ensures proper and timely corrective action is taken in response to reports resulting from the independent audits established to meet point (1).

MAINTENANCE ORGANIZATION EXPOSITION (MOE)

a. Maintenance organization exposition means the document or documents that contain the material specifying the scope of work deemed to constitute approval and showing how the organization intends to comply with this Annex (Part 145). The organization shall provide the competent authority with a maintenance organization exposition, containing the following:
1. A statement signed by the accountable manager confirming that the maintenance organization exposition and any referenced associated manuals define the organization's compliance with this Annex (Part 145) and will be complied with at all times. When the accountable manager is not the chief executive officer of the organization then such chief executive officer shall countersign the statement.
2. The organization's safety and quality policy as specified by point 145.A.65.
3. The title(s) and name(s) of the persons nominated under point 145.A.30(b).
4. The duties and responsibilities of the persons nominated under point 145.A.30(b), including matters on which they may deal directly with the competent authority on behalf of the organization.
5. An organization chart showing associated chains of responsibility between the persons nominated under point 145.A.30(b).
6. A list of certifying staff and support staff.
7. A general description of manpower resources.
8. A general description of the facilities located at each address specified in the organization's approval certificate.
9. A specification of the organization's scope of work relevant to the extent of approval.
10. The notification procedure of point 145.A.85 for organization changes.
11. The maintenance organization exposition amendment procedure.
12. The procedures and quality system established by the organization under points 145.A.25 to 145.A.90.
13. A list of commercial operators, where applicable, to which the organization provides an aircraft maintenance service.
14. A list of subcontracted organizations, where applicable, as specified in point 145.A.75(b).
15. A list of line stations, where applicable, as specified in point 145.A.75(d).
16. A list of contracted organizations, where applicable.

b. The exposition shall be amended as necessary to remain an up to date description of the organization. The exposition and any subsequent amendment shall be approved by the competent authority.
c. Notwithstanding point (b) minor amendments to the exposition may be approved through an exposition procedure (hereinafter called indirect approval).

PRIVILEGES OF THE ORGANIZATION

In accordance with the exposition, the organization shall be entitled to carry out the following tasks:

a. Maintain any aircraft and/or component for which it is approved at the locations identified in the approval certificate and in the exposition;
b. Arrange for maintenance of any aircraft or component for which it is approved at another organization that is working under the quality system of the organization. This refers to work being carried out by an organization not itself appropriately approved to carry out such maintenance under this Part and is limited to the work scope permitted under procedures laid down in point 145.A.65(b). This work scope shall not include a base maintenance check of an aircraft or a complete workshop maintenance check or overhaul of an engine or engine module;
c. Maintain any aircraft or any component for which it is approved at any location subject to the need for such maintenance arising either from the non-serviceability of the aircraft or from the necessity of supporting occasional

line maintenance, subject to the conditions specified in the exposition.

d. Maintain any aircraft and/or component for which it is approved at a location identified as a line maintenance location capable of supporting minor maintenance and only if the organization exposition both permits such activity and lists such locations.
e. Issue certificates of release to service in respect of completion of maintenance in accordance with point 145.A.50.

PART CAO

A Combined Airworthiness Organization (CAO) is published in Commission Regulation EU 2019/1383 and is in force from 24.09.2020.

Part CAO provides a new simplified organization approval for general aviation which provides relief from many of the requirements (For example, no safety management System). The Part CAO does not replace the Subpart F Maintenance Organization, but instead it creates a completely new type of organization, which is specifically adapted to the needs of general aviation. In addition, there is typically a reduced involvement of the competent authority. A combined organization may obtain the following privileges:

- Maintenance
- Continuing airworthiness management
- Airworthiness review
- Issuance of Permit to Fly

GENERAL

Part CAO provides a new set of requirements for Combined Airworthiness Organizations. Such organizations may perform CAMO or maintenance activities only on non-complex aircraft not used by a licensed air carrier.

In Part CAO there is no "base" and "line" maintenance and therefore there is no "support staff" versus "certifying staff". As stated in CAO.A.040, Certifying staff shall exercise their privileges to release to service maintenance if the CAO has ensured:

a. That these certifying staff meet the requirements of point (b) of point 66.A.20 of Annex III (Part 66) except when paragraph 6 of Article 5 refers to a national regulation of a member state, in which case, they shall meet the requirements of such a regulation;
b. That these certifying staff have an adequate understanding of the relevant aircraft or aircraft component(s) to be maintained, or both, as well as of the organization procedures required to perform such maintenance.

SCOPE

Part CAO establishes the requirements to be met by a combined airworthiness organization in order to be issued, upon application, an approval for the maintenance and continuing airworthiness management of aircraft and components for installation thereon, and to continue carrying out those activities, where such aircraft are not classified as complex motor powered aircraft and are not listed in the air operator certificate of an air carrier licensed in accordance with Regulation EC 1008/2008.

TERMS OF APPROVAL

The CAO shall specify the approved scope of work in its combined airworthiness exposition (CAE).

a. For airplanes of more than 2 730 kg maximum take-off mass (MTOM) and for helicopters of more than 1 200 kg MTOM or certified for more than 4 occupants, the scope of work shall indicate the particular aircraft types.
b. For complete turbine engines, the scope of work shall indicate the engine manufacturer or group or series or type or the maintenance task(s).
c. A CAO which employs only one person for both planning and carrying out of all maintenance tasks cannot hold privileges for the maintenance of:
   - airplanes equipped with a turbine engine (in the case of aircraft rated organizations);
   - helicopters equipped with a turbine engine or with more than one piston engine (in the case of aircraft rated organizations);
   - complete piston engines of 450 HP and above (in the case of engine rated organizations);
   - complete turbine engines (in the case of engine rated organizations).
d. For aircraft other than those mentioned in point (a), for components different from complete turbine engines and for non-destructive testing specialized services, the scope of work shall be controlled by the CAO. For maintenance of components different from complete engines, the scope of work shall be classified in accordance with the following system ratings:
   C1: Air Conditioning and Pressurization
   C2: Auto-flight
   C3: Communications and Navigation
   C4: Doors and Hatches
   C5: Electrical Power and Lights
   C6: Equipment
   C7: Engine
   C8: Flight Controls
   C9: Fuel
   C10: Helicopter and Rotors
   C11: Helicopter Transmission
   C12: Hydraulic Power
   C13: Indicating and Recording System
   C14: Landing Gear
   C15: Oxygen
   C16: Propellers
   C17: Pneumatic and Vacuum Systems
   C18: Protection from Ice/Rain/Fire
   C19: Windows
   C20: Structural
   C21: Water Ballast
   C22: Propulsion Augmentation

Organizations obtaining an approval in accordance with this Annex on the basis of an existing organization approval issued in accordance with Subpart G or Subpart F of Annex I (Part M) or Annex II (Part 145), shall include in the scope of work all the necessary details to ensure that the privileges are identical to the ones included in the existing approval.

COMBINED AIRWORTHINESS EXPOSITION

The Combined Airworthiness Exposition (CAE) must contain at least the following information:

- A statement signed by the accountable manager confirming that the organization will at all times work in accordance with the requirements of this Annex and the CAE.
- The CAE's scope of work.
- The title(s) and name(s) of an accountable manager and person or group of persons who are responsible for ensuring that the CAO is always in compliance with the requirements the Annex.
- An organization chart showing the chains of responsibility between the accountable manager and responsible persons.
- A list of certifying staff with their scope of approval, if such staff exist.
- A list of staff responsible for the development and approval of aircraft maintenance programs with their scope of approval, if such staff exist.
- A list of airworthiness review staff with their scope of approval, if such staff exist.
- A list of staff responsible for the issuance of permits to fly, if such staff exist.
- A general description and location of the facilities.
- Procedures specifying how the CAO shall ensure compliance with the requirements of the Annex.
- The CAE amendment procedure.
- The initial CAE shall be approved by the competent authority.

FACILITIES

The CAO shall ensure that all necessary facilities, including adequate office accommodation are provided for it to be able to carry out all the planned work. In addition, where the scope of approval of the organization includes maintenance activities, the CAO shall ensure that:

a. Specialized workshops, hangars and bays provide adequate protection from contamination and the environment.
b. Secure storage facilities are provided for components, equipment, tools and material, under conditions ensuring that unserviceable components and materials are segregated from all other components, material, equipment and tools, that the manufacturer's instructions for storage are complied with and that access to the storage facilities is restricted to authorized personnel.

PERSONNEL REQUIREMENTS

a. The CAO shall appoint an accountable manager, who shall have an authority for ensuring that all activities of the organization can be financed so that those activities are carried out in accordance with the requirements of this Annex.
b. The accountable manager shall nominate a person or group of persons who shall be responsible for ensuring that the CAO is always in compliance with the requirements of this annex. Those person(s) shall ultimately be responsible to the accountable manager.
c. All persons referred to in point (b) shall have the relevant knowledge, background and experience related to continuing airworthiness management or maintenance, as appropriate for their functions.
d. The CAO shall have sufficient appropriately qualified staff for it to be able to carry out the planned work. The CAO shall be entitled to use temporarily subcontracted staff.
e. The CAO shall assess and record the qualification of all personnel.
f. Personnel who carry out specialized tasks, such as welding, or non-destructive testing other than color contrast inspections shall be qualified in accordance with an officially recognized standard.

CERTIFYING STAFF

a. Certifying staff shall comply with the requirements of Article 5. They shall only exercise their privileges to releasThat the certifying staff meet the requirements of point (b) of point 66.A.20 of Annex III (Part 66) except when paragraph 6 of Article 5 refers to a national regulation of a member state, in which case, they shall meet the requirements of such a regulation;
   2. That the certifying staff have an adequate understanding of the relevant aircraft or aircraft component(s) to be maintained, or both, as well as of the organization procedures required to perform such maintenance.
b. As from point (a), in unforeseen circumstances where an aircraft is grounded at a location other than the main base where no appropriate certifying staff are available, the CAO contracted to provide maintenance support may issue a one-off certification authorization, alternatively:
   1. To one of their employees holding type qualifications for aircraft of similar technology, construction and systems.
   2. To any person with no less than 3 years of maintenance experience and holding a valid ICAO aircraft maintenance license rated for the aircraft type requiring certification, provided that there is no organization approved in accordance with this Annex at that location and that the contracted CAO obtains and holds on file evidence of the experience and license of that person. The issuance of a one-off certification authorization shall be reported by the CAO to the competent authority within 7 days of the issuance. The CAO issuing the one-off certification authorization shall ensure that any such maintenance that could affect flight safety is rechecked.
c. As from point (a), the CAO may use certifying staff qualified in accordance with the following requirements when providing maintenance support to operators involved in commercial operations, subject to appropriate procedures to be approved as part of the combined airworthiness exposition (CAE):
   1. For a repetitive preflight airworthiness directive (AD) which specifically states that the flight crew may carry out such an AD, the CAO may issue a limited certifying staff authorization to the pilot-in-command on the basis of the flight crew license held, provided that the CAO ensures that sufficient practical training has been carried out by the pilot-in-command so he/she can accomplish the AD to the required standard.
   2. In the case of aircraft operating away from a supported

location, the CAO may issue a limited certifying staff authorization to the pilot in command, on the basis of the flight crew license held, provided that the organization ensures that sufficient practical training has been carried out so that such a commander can accomplish the task to the required standard.

d. The CAO shall record the details concerning certifying staff and maintain an up-to-date list of all certifying staff, together with details on their scope of approval, as part of the organization's exposition.

COMPONENTS, EQUIPMENT AND TOOLS

a. The CAO shall:
   1. Hold the equipment and tools specified in the maintenance data provided for in point CAO.A.055, or verified equivalents as listed in the CAE, as necessary for day-to-day maintenance within the scope of the organization's approval;
   2. Have a procedure to ensure that it has access to all other equipment and tools necessary to carry out its work, used only on an occasional basis, where needed.

b. The CAO shall ensure that the tools and equipment it uses are controlled and calibrated to an officially recognized standard. It shall keep records of such calibrations and the standards used and comply with point CAO.A.090.

c. The CAO shall inspect, classify and appropriately segregate all incoming components in accordance with points M.A.501 and M.A.504 of Annex I (Part M) or with points ML.A.501 and ML.A.504 of Annex Vb (Part-ML), as applicable.

MAINTENANCE DATA AND WORK ORDERS

a. The CAO shall hold and use applicable current maintenance data specified in point M.A.401 of Annex I (Part M) or in point ML.A.401 of Annex Vb (Part ML), as applicable, in the performance of maintenance, including modifications and repairs. However, in the case of customer-provided maintenance data, it shall only be required to hold such data when the work is in progress.

b. Before the commencement of maintenance, a written work order shall be agreed between the CAO and the person or organization requesting maintenance, in a manner that clearly establishes the maintenance to be carried out.

AIRCRAFT CERTIFICATE OF RELEASE TO SERVICE

At the completion of any aircraft maintenance carried out in accordance with this Annex, an aircraft CRS shall be issued in accordance with point M.A.801 of Annex I (Part M) or point ML.A.801 of Annex Vb (Part ML), as applicable.

COMPONENT CERTIFICATE OF RELEASE TO SERVICE

a. At the completion of all component maintenance in accordance with this Annex, a component CRS shall be issued in accordance with point M.A.802 of Annex I (Part M) or point ML.A.802 of Annex Vb (Part ML), as applicable. An EASA Form 1 shall be issued in accordance with Appendix II to Annex I (Part M), except as provided for in points (b) or (d) of point M.A.502 of Annex I (Part M) and point ML.A.502 of Annex Vb (Part ML) and for components fabricated in accordance with point (c) of point CAO.A.020.

b. The EASA Form 1 referred to in point (a) may be generated from a computer database.

RECORD KEEPING

a. The CAO shall retain the following records:
   1. The maintenance records necessary to demonstrate that all requirements of this Annex have been met for the issuance of the CRS, including the subcontractor's release documents; the CAO shall provide a copy of each CRS to the owner of the aircraft, together with a copy of any specific repair or modification data used for the repairs or modifications carried out.
   2. The continuing airworthiness management records required by any of the following: (i) point M.A.305 and, if applicable, point M.A.306 of Annex I (Part M); (ii) point ML.A.305 of Annex Vb (Part-ML).
   3. Where the CAO has the privilege referred to in point (c) of point CAO.A.095, it shall retain a copy of each airworthiness review certificate issued in accordance with point (a) of point ML.A.901 of Annex Vb (Part ML) and recommendation issued or, as applicable, extended, together with all supporting documents;
   4. Where the CAO has the privilege referred to in point (d) of point CAO.A.095, it shall retain a copy of each permit to fly issued in accordance with point 21.A.729 of Annex I (Part 21) to Regulation EU 748/2012.

b. The CAO shall retain a copy of the records described in point (a 1), and any associated maintenance data, for a period of 3 years from the date at which it released to service the aircraft or aircraft component to which the work relates.

c. The CAO shall retain a copy of the records referred to in points (a 2) to (a 4) for a period of two years from the date at which the aircraft has been permanently withdrawn from service.

d. All records shall be stored in a manner that ensures protection from damage, alteration and theft.

e. All computer hardware used for backup of the maintenance records shall be stored in a different location from that containing those data and in an environment that ensures that they remain in good condition.

f. Where the continuing airworthiness management of an aircraft is transferred to another organization or person, all the records retained under points (a 2) to (a 4) shall be transferred to that organization or person. From the moment of the transfer, points (b) and (c) shall apply to that organization or person.

g. Where the CAO terminates its operation, all retained records shall be transferred as follows:
   1. The records referred to in point (a)(1) shall be transferred to the last owner or customer of the respective aircraft or component or shall be stored as specified by the competent authority.
   2. The records referred to in point (a)(2) to (a)(4) shall be transferred to the owner of the aircraft.

PRIVILEGES OF THE ORGANIZATION

The CAO shall have the following privileges:

a. Maintenance
   1. Maintain any aircraft or component for which it is approved at the locations specified in the approval certificate and the CAE.
   2. Arrange for the performance of specialized services at another organization appropriately qualified under the control of the CAO, in accordance with the appropriate procedures set out in the CAE and approved by the competent authority.
   3. Maintain any aircraft or component for which it is approved at any location, where the need of such maintenance arises either from the unserviceability of the aircraft or the need for supporting occasional maintenance, in accordance with the conditions specified in the CAE.
   4. Issue certificates of release to service upon completion of maintenance, in accordance with point CAO.A.065 or CAO.A.070.

b. Continuing airworthiness management
   1. Manage the continuing airworthiness of any aircraft for which it is approved.
   2. Approve the AMP, in accordance with point (b 2) of point ML.A.302, for aircraft managed in accordance with Annex Vb (Part ML).
   3. Carry out limited continuing airworthiness tasks with any contracted organization working under their quality system, as listed on the approval certificate.
   4. Extend, in accordance with point (f) of point M.A.901 of Annex I (Part M) or point (c) of point ML.A.901 of Annex Vb (Part ML), an ARC that has been issued by the competent authority, another CAO or a CAMO.

c. Airworthiness review
   1. A CAO with its principal place of business in one of the member states, the approval of which includes the privileges referred to in point (b), may be approved to carry out airworthiness reviews in accordance with point M.A.901 of Annex I (Part M) or point ML.A.903 of Annex Vb (Part ML), as applicable, and: (i) issue the related ARC or recommendation for the issuance of the ARC; (ii) extend the validity of an existing ARC.
   2. A CAO with its principal place of business in one of the member states, the approval of which includes the privileges referred to in point (a), may be approved to carry out airworthiness reviews in accordance with point ML.A.903 of Annex Vb (Part ML) and issue the related ARC.

d. Permit to fly A CAO with its principal place of business in one of the member states, the approval of which includes the privileges referred to in point (c), may be approved to issue a permit to fly in accordance with point 21.A.711 of Annex I (Part 21) to Regulation EU 748/2012 for those aircraft for which it can issue the ARC when it attests conformity with the approved flight conditions, in accordance with an adequate procedure provided for in the CAE.

e. A CAO may be approved for one or more privileges.

QUALITY SYSTEM AND ORGANIZATIONAL REVIEW

a. To ensure that the CAO continues to meet the requirements of this annex, this organization shall establish a quality system and designate a quality manager.

b. The quality system shall monitor the carrying out of the activities of the organization covered by this annex. It shall monitor in particular:
   1. That all those activities are performed in accordance with the approved procedures.
   2. That all contracted maintenance tasks are carried out in accordance with the contract.
   3. That the organization continues to comply with the requirements of this Annex.

c. The records of that monitoring shall be retained for at least the previous two years.

d. Where the organization holding a CAO approval is additionally approved in accordance with an annex other than this annex, the quality system may be combined with that required by the other annex.

e. A CAO shall be considered as a small CAO when one of the following condition is met:
   1. The scope of the CAO does only contain aircraft covered by Part ML.
   2. The CAO does not exceed 10 full time equivalent staff involved in maintenance.
   3. The CAO does not exceed 5 full time equivalent staff involved in continuing airworthiness management.

f. In the case of a small CAO, the quality system may be replaced by regular organizational reviews, subject to the approval of the competent authority. In that case, the CAO shall not contract continuing airworthiness management tasks to other parties.

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Question 3-1
What document makes official the transfer of an aircraft undergoing base maintenance back to the air operator?

Question 3-2
What document outlines a Part 145 organizations procedures of operation which been agreed to by the national authority?

Question 3-3
What are the basic privileges of a Category B Part 145 organization?

Question 3-4
Besides health effects, what is an additional concern regarding excess noise in a maintenance facility?

Question 3-5
What person (title) bears the final responsibility for the operation of a Part 145 organization?

Question 3-6
A person with which qualification is required for a base maintenance facility, but not for a line maintenance facility?

Question 3-7
What recent experience is required for a B1 technician to act as certifying staff in a Part 145 organization?

Question 3-8
A Part 145 organization must retain the personnel and experience records of certifying staff for a minimum of _____ years following the cessation of employment.

Question 3-9
In what way must serviceable and unservicable components be identified in a Part 145 organization?

Question 3-10
What general limitation exists for a Part CAO Combined Maintenance Organization?

SUBMODULE 3 PRACTICE ANSWERS

Answer 3-1
The Certificate of Return to Service (CRS)

Answer 3-2
The Maintenance Organization Exposition (MOE)

Answer 3-3
The organization may perform maintenance on uninstalled engines and APUs.

Answer 3-4
It can cause distractions during inspection procedures.

Answer 3-5
The Accountable Manager.

Answer 3-6
Personnel with a Category C license are required in a base maintenance facility.

Answer 3-7
6 months of relevant experience within the proceeding two year period.

Answer 3-8
Three years

Answer 3-9
Serviceable components in satisfactory condition must be released with an EASA Form 1 and marked or tagged as acceptable for use.

Answer 3-10
Work is limited to non-complex aircraft not used by a licensed carrier.

Independent Certifying Staff

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		A1
10.4	**Independent Certifying Staff** Privileges, responsibilities, record-keeping, limitations, and oversight according to Part-M, Part-66 and Part-ML.	-

10.4 - INDEPENDENT CERTIFYING STAFF

This submodule is not required for Cat-A Licensing.

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Air Operations

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		A1
10.5	**Air Operations** General understanding of Regulation (EU) No 965/2012 (the Air Operations Regulation); Differences between commercial and non-commercial air operations, and their influence on aircraft maintenance; Air Operator Certificates (AOCs) and self-declaration authorisations; Air operator responsibilities, in particular regarding continuing airworthiness and maintenance; Specialized operations/specific approvals: ETOPS, CAT I/II/III, and BRNAV. Minimum Equipment List (MEL) and Configuration Deviation List (CDL); Aircraft placarding and markings; Documents to be carried on board: — Certificate of Airworthiness/Restricted Certificate of Airworthiness; — Airworthiness Review Certificate; — Permit to Fly; — Certificate of Registration; — Noise Certificate; — Weight and Balance report; — Radio Station Licence.	1

10.5 - AIR OPERATIONS

DEFINITIONS IMPORTANT FOR THIS SUBMODULE

1008/2008 License	This Regulation regulates the licensing of Community air carriers, the right of Community air carriers to operate intra-Community air services and the pricing of intra-Community air services. This license is established to recognize the potential link between the financial health of an air carrier and safety and in order to reduce risks to passengers.
Aircraft Flight Manual - AFM	A manual, associated with the certificate of airworthiness, containing limitations within which operation of the aircraft is to be considered airworthy and, instructions and information necessary to the flight crew members for the safe operation of the aircraft.
Airworthy	Airworthy means the aircraft conforms to its type design and is in a condition for safe operation.
ARO	Authority Requirements for Air Operations.
Commercial Air Transport	Technical Requirements for Commercial Air Transport means an aircraft operation to transport Passengers, cargo or mail for remuneration or other valuable consideration.
Commercial Operations	Any operation of an aircraft, in return for remuneration or other valuable consideration, which is available to the public or, when not made available to the public, which is performed under a contract between an operator and a customer, where the latter has no control over the operator.
Continuing Airworthiness (CoA)	All the processes ensuring that, at any time in its operating life, the aircraft complies with the airworthiness requirements in force and is in a condition for safe operation.
Limited Operations	Means the operations of other-than Complex motor powered Aircraft (CMPA) for: - Cost-shared flights by private individuals, on the condition that the direct cost is shared by all the occupants of the aircraft, pilot included and the number of persons sharing the direct costs is limited to six. - Competition flights or flying displays, on the condition that the remuneration or any valuable consideration given for such flights is limited to recovery of direct costs and a proportionate contribution to annual costs, as well as prices of no more than a value specified by the competent authority. - Introductory flights, parachute dropping, sailplane towing or aerobatic flights.
Mass & Balance	Mass and balance data is required to make sure the aircraft is capable of operating within the approved envelope.
NCC	Technical Requirements for Non-Commercial operators with Complex Motor-Powered Aircraft (CMPA).
NCO	Technical Requirements for Non-Commercial operators with other than CMPA.

Operational Requirements	Items required to be installed to perform a specific type of operation.
ORO	Organization Requirements for Air Operators Requirements for Commercial and non-commercial operators, applicable to CAT, NCC, and SPO.
Part M (Annex I)	Technical requirements in terms of Continuing Airworthiness management, and maintenance, for non-Light aircraft (non-light) and/or operating in Commercial Air Transport (CAT) under 1008/2008 license.
Part M-L (LIGHT) (Annex Vb)	The requirements of Part-ML shall apply to the following other than CMPA not listed in the air operator certificate of an air carrier under 1008/2008 license: - Aeroplanes of 2 730 kg maximum take-off mass (MTOM) or less; - Rotorcraft of 1 200 kg MTOM or less, certified for a maximum of up to 4 occupants; - Other ELA2 aircraft.
Specialized Operation (SPO)	Any operation other than commercial air transport where the aircraft is used for specialized activities such as agriculture, construction, photography, surveying, observation and patrol, aerial advertisement.
Specific Approvals (SPA)	Specific Approvals (Examples): - RVSM: Reduced Vertical Minimum Separation - LVO: Low Visibility Operations - ETOPS: Extended range operations with Two Engine Aeroplanes - DG: Dangerous Goods

CMPA = Complex Motor-Powered Aircraft Criteria

	AIRPLANE	**HELICOPTER**
MTOM (Maximum Take-Off Mass)	5 700 kgs or	3 175 kgs or
Passenger Seating (Certificated for a max passenger seating configuration of more than)	19 or	9 or
Pilot(s) (Certificated for operation with a minimum crew of at least)	2 Pilots or	2 Pilots or
Engines	Equipped with (a) turbojet engine(s) or more than 1 turboprop engine.	A tilt rotor aircraft.
Light Aircraft	(a) Aeroplanes up to 2 730 kg MTOM; (b) Rotorcraft up to 1 200 kg MTOM/max 4 occupants; (c) And other ELA2 (European Light Aircraft). - Aeroplanes with a MTOM of 2 000 kg or less or; - Sailplane or powered sailplane of 2 000 kg MTOM or less or; - Balloon; - Very light rotorcraft.	

GENERAL UNDERSTANDING OF EU-OPS

Commission Regulation EU No 965/2012 and its subsequent amendments lay down technical requirements and administrative procedures related to air operations pursuant to Regulation EC 216/2008 of the European parliament and of the council (basic regulation). This Regulation is officially referred to as IR OPS (implementing rules – operations), but it is also known as EASA OPS or EASA AIR OPS. **Figure 5-1** describes the general structure of air operations and its related definitions.

DIFFERENCES BETWEEN COMMERCIAL AND NON COMMERCIAL AIR OPERATIONS MAINTENANCE

EASA applied classifications to develop a different set of technical rules for air operations taking into account the principle of proportionality and the need to have different safety levels. [**Figure 5-2**]

EASA developed two different sets of rules for non commercial operations, depending on the complexity of the aircraft:

- For the operation of non complex aircraft, basic safety rules apply (Part NCO). The term NCO stands for non commercial operations with other than complex aircraft;
- For the operation of complex aircraft, more complex safety rules apply (Part NCC and partly Part ORO), particularly taking into account that complex aircraft may carry a larger number of passengers and usually require professional teams for their operations. The term NCC stands for non commercial operations with complex motor powered aircraft.

NON COMMERCIAL OPERATION

The basic regulation defines commercial operations as "any operation of an aircraft, in return for remuneration or other valuable consideration, which is available to the public or, when not made available to the public, which is performed under a contract between the operator and a customer, where the customer has no control over the operator".

A simplified version of this is to ask if payment is being made for the flight. If an aircraft is chartered, or if tickets are sold to passengers then this is clearly a commercial operation. If there is no payment for the specific flight then the operation might be non commercial even if other payments are made, e.g. an annual management charge.

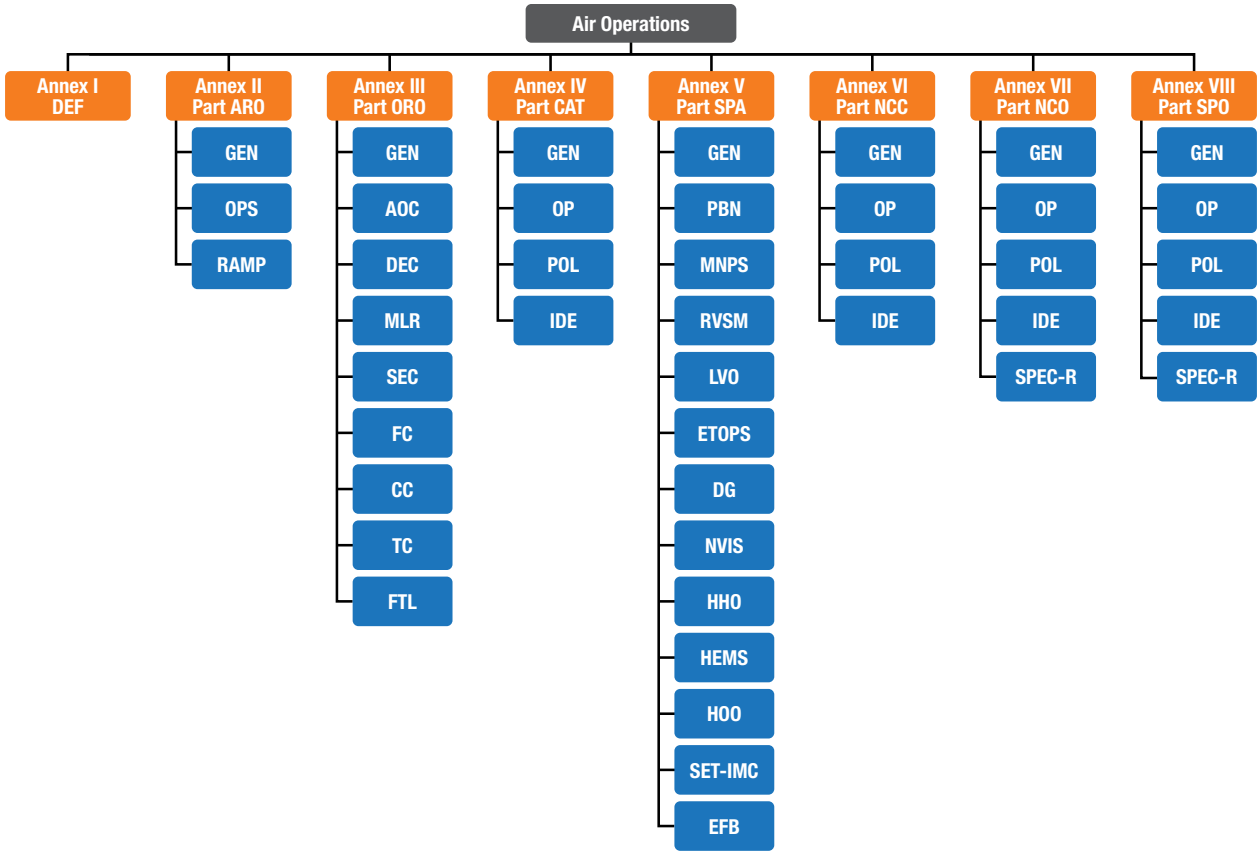


Figure 5-1. Air Operations global chart.

If a corporation has a flight department as an entity within the corporate structure then there might be a payment from one part of the corporation to the flight department. In this case, the operator is under the control of the customer (corporation) so this would be non commercial.

COMPLEX AIRCRAFT OPERATORS

The requirements for non commercial operators of complex motor powered aircraft are not the same as the requirements for airlines, but they're close. There are rules about how an operator is organized as well as those that dictate how the aircraft is operated.

Non commercial operators need to comply with Annex III to Commission Regulation EU No 965/2012, 'Organization Requirements for Air Operators', known as Part ORO. Part ORO contains the management system requirements. In order to comply with the management system requirements NCC operators need to have:

- An accountable manager who has overall responsibility for financing the operation and is accountable for safety.
- A safety policy and safety risk assessment processes (i.e. a safety management system).
- Trained, competent personnel including 'nominated persons', who ensure that the operation complies with all the relevant requirements; a safety manager and a compliance monitoring manager.

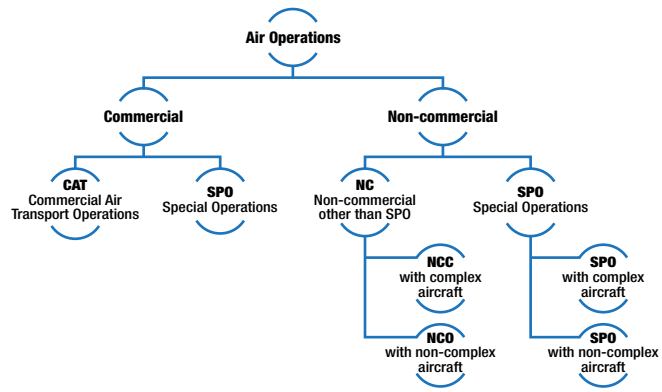


Figure 5-2. Classification of commercial and non commercial air operations.

- Documentation including an operations manual; a minimum equipment list for each aircraft and a records system.
- A compliance monitoring system.

AIRWORTHINESS

The owner or lessee of an aircraft is responsible for the continuing airworthiness of that aircraft including ensuring that the aircraft is airworthy, that all emergency and safety equipment is correctly installed and serviceable, that maintenance is performed in accordance with an approved maintenance schedule and that the certificate of airworthiness remains valid. For large aircraft, that is

aeroplanes with maximum take off mass of more than 5 700 kg and multi engine helicopters, the owner must have a contract with an approved Continuing Airworthiness Management Organization (CAMO) who will assume this responsibility.

MAINTENANCE OF COMMERCIAL AND NON COMMERCIAL AIRCRAFT

The maintenance of commercial and non commercial aircraft, while sharing the fundamental goal of ensuring airworthiness and safety, differs in several key aspects due to the nature of their operations, regulatory requirements, and scale.

REGULATORY ENVIRONMENT

- *Commercial Aircraft*—Subject to stricter and more detailed regulatory requirements due to the responsibility of carrying fare paying passengers or cargo. Regulations are often governed by bodies like EASA (Part 145) or FAA (Part 121, or Part 135).
- *Non Commercial Aircraft*—Regulations are typically less stringent. The focus is still on safety but with more flexibility considering the scale and scope of operations.

MAINTENANCE STANDARDS AND SCHEDULES

- *Commercial Aircraft*—Maintenance schedules are highly structured and rigorous, often based on detailed manufacturer recommendations and regulatory mandates. Includes routine, periodic, and heavy maintenance checks.
- *Non Commercial Aircraft*—Maintenance schedules can be more flexible. While annual inspections are required, owners have more discretion in scheduling routine maintenance.

SCALE AND COMPLEXITY

- *Commercial Aircraft*—Maintenance operations are large scale, requiring sophisticated facilities and equipment. The complexity of commercial aircraft systems also demands specialized expertise.
- *Non Commercial Aircraft*—Typically, the scale of maintenance is smaller, and the aircraft systems may be less complex. Maintenance can often be carried out in smaller facilities.

MAINTENANCE PERSONNEL

- *Commercial Aircraft*—Maintenance must be performed by highly trained and certified technicians. Specific certifications are required for different types of aircraft.
- *Non Commercial Aircraft*—While still requiring qualified mechanics, the certification requirements are often less demanding. Aircraft owners can sometimes perform certain types of maintenance themselves.

DOCUMENTATION AND RECORD KEEPING

- *Commercial Aircraft*—Extensive documentation is required. Maintenance records are meticulously kept, detailing every repair, inspection, and maintenance activity.
- *Non Commercial Aircraft*—Record keeping is still important but may not be as exhaustive as in commercial aviation. Compliance with airworthiness directives and annual inspections is key.

AIR OPERATOR CERTIFICATE (AOC) AND SELF-DECLARATION AUTHORIZATIONS

Aircraft operators under EU regulatory framework either:

1. Declare their capability, and the availability to them of the means, to discharge the responsibilities associated with the operation of aircraft in compliance with applicable implementing acts/regulations (known as Declaration).
2. Hold an Aircraft Operator Certificate – AOC.
3. Comply with applicable regulations and rules.

This will depend on two things:

1. Which category of aircraft is used and whether aircraft is complex motor-powered aircraft or other than complex motor-powered aircraft
2. Which type/subtype of air operation is carried out.

This is explained in [**Table 5-1**]. EU Regulation 965/2012 air operations for aeroplanes and helicopter classification. [**Table 5-2**]

AIRCRAFT OPERATOR CERTIFICATE – AOC

- Definition: An AOC is a certificate that authorizes an aircraft operator to carry out specific commercial air transport operations. AOC shall be issued upon application, when the applicant has demonstrated that it complies with the applicable regulations. AOC shall specify the privileges granted to the aircraft operator. AOC may be amended to add or remove privileges. AOC may be limited, suspended or revoked, when the holder no longer complies with the rules and procedures for issuing and maintaining such certificate.
- Purpose: Airlines in Europe must obtain an AOC to operate legally. It ensures compliance with safety and operational standards.
- Issuance: In most cases, AOCs are issued only by the National Aviation Authority (NAA) of the operator's home country. This NAA is competent authority for issuance of AOC/ initial certification, overight and enforcement.
- Transfer to EASA: Under specific conditions, an EU Member State can transfer AOC responsibilities to the European Union Aviation Safety Agency (EASA). EASA then becomes the competent authority for initial certification, oversight, and enforcement.

SELF-DECLARATION AUTHORIZATIONS

- Definition: Self-declaration authorizations allow aircraft operators to declare compliance with specific regulations without external certification.
- Scope: Typically used for non-commercial operations or specific activities within commercial operations.
- Responsibility: The operator assumes responsibility for compliance.
- Risk-Based Approach: Self-declaration relies on the operator's assessment of risk and adherence to applicable regulations.
- Examples: Some non-commercial flights, such as private flights or certain aerial work operations, may operate under self-declaration.

Category of Aircraft	Type of Air Operation	Applicable regulation within EU regulatory framework based on Basic Regulation (EU 2018/1139)	AOC or Declaration
Aeroplane	Aeroplane Operations	EU Regulation 965/2012	See Table 5-2
Helicopter	Helicopter Operations	EU Regulation 965/2012	See Table 5-2
Balloon	Balloon Operations	EU Regulation 2018/395	Declaration – Only for commercial air transport with balloons.
Sailplanes	Sailplanes Operations	EU Regulation 2018/1976	Declaration – Only for commercial air transport with sailplanes.
Unmanned Aircraft System (UAS)	UAS Operations	EU Regulation 2019/947	
Vertical Take-Off and Landing (VTOL) Capable Aircraft (VCA)	Innovative Air Mobility (IAM) Operations	EU Regulation 965/2012	

Table 5-1. AOC or declaration for different aircraft categories.

(CAT) Commercial Air Transport Operations	AOC (and Operating License According EU 1008/2012)
(SPO) Commercial Special Operations	Declaration
(SPO) Non-commercial Special Operations with EASA Complex Motor Powered Aircraft	Declaration
(SPO) Non-commercial Special Operations with EASA Other Than Complex Motor Powered Aircraft	Declaration
(NCC)Non-commercial Operations with EASA Complex Motor Powered Aircraft	No Need For Declaration
(NCO) Non-commercial Operations with EASA Other Than Complex Motor Powered Aircraft	No Need For Declaration

Table 5-2. AOC or declaration for aeroplanes and helicopters.

Remember that AOCs are essential for commercial airlines, while self-declaration is more common for specific scenarios.

AIR OPERATOR'S CERTIFICATE (SUBPART AOC)

Prior to the commencing of Commercial Air Transport (CAT) operations, the operator shall apply for and obtain an Air Operator Certificate (AOC) issued by the competent authority. [**Form 5-1**] To do so, the operator shall provide the following information to the competent authority:

- The official name and business name, address, and mailing address of the applicant.
- A description of the proposed operation, including the type(s), and number of aircraft to be operated.
- Description of the management system, including organizational structure.
- The name of the accountable manager.
- The names of the nominated persons together with their qualifications and experience.
- A copy of the operations manual.
- A statement that all the documentation sent to the competent authority have been verified by the applicant and found in compliance with the applicable requirements.

Applicants should be able to demonstrate to the competent authority the following:

- They comply with all the requirements of Annex IV to the Basic Regulation 2018/1139, the Organizational Requirements Annex (Part ORO), Annex IV (Part CAT) and Annex V (Part SPA).
- All aircraft operated have a certificate of airworthiness (CofA).
- Its organization and management are suitable and properly matched to the scale and scope of the operation.

Privileges of the operator, including those granted in accordance with Annex V (Part SPA), shall be specified in the operations specifications (OPS SPEC) of the certificate. [**Form 5-2**]

OPERATOR'S RESPONSIBILITIES

The owner of the aircraft shall be responsible for the continuing airworthiness of aircraft and shall ensure that no flight takes place unless all of the following requirements are met:

- The aircraft is maintained in an airworthy condition.
- Operational and emergency equipment fitted is correctly installed and serviceable or clearly identified as unserviceable.
- The airworthiness certificate is valid.
- The maintenance of the aircraft is performed in accordance with the AMP.

AIRCRAFT MAINTENANCE PROGRAMS

An aircraft maintenance program is a document which describes or references specific scheduled maintenance tasks and their frequency of completion, along with the associated procedures and related standard maintenance practices for the safe operation of the aircraft to which it applies.

Maintenance of a transport aircraft is performed under the responsibility of the aircraft operator according to a program

he/she has to detail along with the civil aviation agency of his/her country. This rule derives from agreements which guide international commercial aviation as recommended by ICAO.

SPECIALIZED OPERATIONS

Regulations require aircraft operators to be specifically approved to conduct certain types of operations. In Europe, the applicable regulation is Annex V to Regulation EU No 965/2012, known as Part SPA.

For each type of operation listed on this page, an aircraft operator needs to demonstrate to the Competent Authority that it complies with the applicable requirements before being approved.

The competent authority that needs to issue the approval is the authority of the operator's state. In most cases, this is the same as the state where the aircraft is registered, but for European non commercial operators that use aircraft registered in non European states, the European authority may accept an approval issued by the state of registry.

PERFORMANCE BASED NAVIGATION

Operation on certain routes or classifications of airspace requires an operator to use performance based navigation (PBN) techniques. The use of PBN means that an aircraft can navigate along a defined track with the necessary accuracy without tracking from one radio beacon to the next. The techniques are 'performance based' because the regulations don't specify that particular equipment must be installed on the aircraft and used by the pilot; instead, they specify the required performance of the navigation system.

There are many different classifications of PBN according to the particular operating environment. These are classified as area navigation specifications or required navigation performance (RNP) specifications. The difference is that to satisfy RNP requirements, there must be on board performance monitoring so that the pilot is notified if the navigation system shouldn't be relied on.

All European upper airspace requires aircraft to operate according to basic area navigation requirements, known as B-RNAV, but no specific approval is required for this. Since 2018, PBN operations have been included in mandatory pilot training, so most types of PBN do not require an operator to hold a specific approval.

REDUCED VERTICAL SEPARATION MINIMA (RVSM)

To operate above flight level 290 (roughly 29 000 feet), operators must hold an RVSM approval. This ensures that the aircraft altimetry and operating procedures support vertical separation from other aircraft of just 1 000 feet.

To obtain approval, the aircraft must be appropriately certified, and the maintenance program needs to ensure that the altitude measuring system remains accurate and reliable. Pilots need to receive specific training, and operating procedures will ensure that they monitor the altimetry systems for any deviations from the correct flight levels. An operator will also need to put a monitoring program in place, including periodic checks of the accuracy of height keeping in flight. Regional monitoring agencies maintain a database of aircraft granted RVSM approval by their competent authorities so that air traffic control can verify that aircraft are properly approved.

LOW VISIBILITY APPROACH OPERATIONS (CAT II/III)

Operators need specific approval to use Category II (CAT II) or Category III (CAT III) approach operations. CAT II involves using flight director, auto-land or a heads-up display to fly down to decision heights as low as 100 ft. CAT III can use decision heights down to 0 ft. or no decision height. The actual limits applicable for CAT III depend on the equipment installed on the aircraft and the approval issued to the operator. To achieve approval for CAT II or III operations, an operator needs to have been operating the aircraft type for some time and conduct a number of approach operations using CAT II/III procedures and equipment. The operator also needs to have a system for monitoring the success rate of these approaches.

DEFINITIONS

- *Category II*—Landing following a precision approach using an instrument landing system or microwave system with a decision height of below 200 feet but not less than 100 feet. and runway visual range not less than 300 meters.
- *Category IIIA*—Landing following a precision approach using an instrument or microwave landing system with a decision height of below 100 feet and runway visual range less than 200 meters.
- *Category IIIB*—Landing following a precision approach using an instrument or microwave landing system with a decision height of below 50 feet and runway visual range less than 200 meters but not less than 75 meters.

LOW VISIBILITY OPERATIONS - GENERAL OPERATING RULES

An operator may conduct either CAT II or CAT III all weather operations if:

- Each airplane is certified for operations with decision heights less than 200 feet, and equipped in accordance to the regulations in force.
- A suitable system for recording successful or missed approaches and/or automatic landings is established to monitor the overall safety of the operation.
- All such air operations are approved by the authority.
- The crew consists of two trained and qualified pilots.
- The aircraft is equipped with, and altitude is measured with a functioning radio altimeter.
- All weather operations are approved and available in the aircraft manual including assigned tasks for each crew member during the taxing, take off, approach, and landing phases of flight.

In addition, the captain must ensure that:

- The state of visual and non-visual equipment is satisfactory prior to beginning a low visibility take off or a CAT II or III precision approach.
- Appropriate low visibility operating procedures are in place and in accordance with information received from air

traffic control prior to the start of a low visibility take off or approach.
- Flight crew members are adequately qualified prior to take off in low visibility with less than 150 meter runway visual range or a Cat II or III precision approach.

EXTENDED DIVERSION TIME OPERATIONS (EDTO/ETOPS)

ICAO Requirements for Extended Range Twin Engine Operations (ETOPS) have been in place since 1985 when they were introduced to apply an overall level of operational safety for twin engine aeroplanes which was consistent with that of the modern three and four engine aeroplanes then flying, to which no restrictions were applied.

In 2012, changes to ICAO Annex 6 Part 1 introduced the Extended Diversion Time Operations (EDTO) regime in place of ETOPS. Annex 6 contains guidance on extended range operations for all turbine engine aeroplanes which are conducted beyond 60 minutes from a point where it is possible to fly to an enroute alternate aerodrome. EDTO flights are subject to a process of explicit approval which has both aeroplane type design and aeroplane operational requirements.

DEFINITIONS

The following requirements must be met in order for approval of EDTO operations:
- An approved EDTO aircraft maintenance program including specific tasks and inspections must be in place.
- A certified EDTO preflight program must be performed by qualified certifying staff.
- An EDTO manual linked with a continuing aircraft management exposition CAME program must be in place.
- A trend analysis and event recording program must be in place.
- The engines must be able to be started in flight via the APU.
- An oil analysis and consumption monitoring program must be in place.
- Continuous engine monitoring must be available.
- An aircraft technical log must be present.
- An approved maintenance contract must be in place.

MINIMUM EQUIPMENT LIST (MEL) AND CONFIGURATION DEVIATION LIST (CDL)

MELS AND MMELS

Each operator must establish, for each airplane a Minimum Equipment List (MEL) which must then be approved by the authority. The MEL is based on, but at least as restrictive as the relevant Master Minimum Equipment List (MMEL) which is also accepted by the authority.

The MMEL lists the items which may be temporarily inoperative or associated with special operating conditions as applicable for a specific aircraft type or model. An operator may not operate an airplane which is not compliant with the MEL unless given special permission from the authority. However, in no circumstances may operations occur if not in compliance with the MMEL. Each MMEL contains the following:

1. Approval status, including date of approval and effective date.
2. A preamble, containing considerations on the purpose and limitations, utilization, multiple inoperative items, rectification interval extension, definitions and, if appropriate, clarifying notes which adequately reflect the scope, extent and purpose of the list.
3. The list of items, and including for each item:
   - The rectification interval category.
   - The number installed or a dash symbol, as applicable.
   - The number required or a dash symbol, as applicable.
   - The operational procedure symbol, as applicable.
   - The maintenance procedure symbol as applicable.
   - Placard indications, as applicable.
   - Any associated conditions and limitations, including the intent and periodicity for the accomplishment of the operational and maintenance procedure, as applicable.

System and sequence number items give detail on the equipment, system, component and function. [**Form 5-3**]

RECTIFICATION INTERVALS

Inoperative items or components, deferred in accordance with the MEL, must be rectified at or prior to the rectification intervals established by the following letter designators.
- *Category A*—No standard interval is specified, however, items in this category shall be rectified in accordance with the conditions stated in the MMEL. Where a time period is specified in days, the interval excludes the day of discovery. Where a time period is specified in other than days, it shall start at the point when the defect is deferred in accordance with the operator's approved MEL.
- *Category B*—Items in this category shall be rectified within three (3) calendar days, excluding the day of discovery.
- *Category C*—Items in this category shall be rectified within ten (10) calendar days, excluding the day of discovery.
- *Category D*—Items in this category shall be rectified within 120 calendar days, excluding the day of discovery.

CONFIGURATION DEVIATION LIST

The Configuration Deviation List (CDL) allows for continued operations with missing secondary airframe and engine parts. Approval for operating with these parts missing is authorized by an amendment to the type certificate which as a result requires an aircraft flight manual supplement. Any part not included in the CDL must be considered necessary for flight. Therefore, without a CDL, missing secondary airframe and engine parts would ground the airplane until repair or replacement of the part is accomplished. An approved CDL is evaluated based on Advisory Circular AC25-7A during flight testing for aircraft certification and contains the necessary takeoff performance decrement, the landing performance decrement, and the enroute performance decrement as appropriate for the airplane type.

AIRCRAFT PLACARDING AND MARKINGS

Markings and placards are defined in the individual aircraft type design. Some information may also be found in the Type

Certificate Data Sheet. The identification of products shall include the following information:

- Manufacturer's name.
- Product designation.
- Manufacturer's serial number.
- Any other information the Agency finds appropriate.

Markings and placards on instruments, equipment, controls, etc. shall include such limitations or information as necessary for the direct attention of the crew during flight. [**Figure 5-3**]

Markings and placards or instructions shall be provided to give any information that is essential to ground handling in order to preclude the possibility of mistakes in ground servicing (e.g. towing, refueling) that could pass unnoticed and that could jeopardize the safety of the aircraft in subsequent flights.

Emergency markings are also required to give information to passengers and crew. The location of emergency exits, emergency or floor proximity lighting, the location of fire extinguishers and fire axes, are identified with red letters and signs. Emergency exit placards must meet specific criteria as they have to be able to be understood by all the passengers with clear, simple, and precise operating instructions.

EMERGENCY EXIT MARKINGS

For example, all the emergency exit markings must meet the following criteria:

- Each passenger emergency exit, its means of access, and its means of opening is conspicuously marked. [**Figure 5-4**]
- The identity and location of each passenger emergency exit is recognizable from a distance.
- Means are provided to assist the occupant in locating the exits in conditions of dense smoke.
- The location of each passenger emergency exit is indicated by a sign visible to occupants approaching along the passenger aisles.
- The location of the operating handle and instructions for opening exits from the inside must be clearly shown.
- Each exit that is operable from the outside, and its means of opening must also be marked from the outside. [**Figure 5-5**]

NATIONAL REGISTRATION MARKINGS

National registration markings must be installed and visible. They include the registration number, national identity, and a fireproof registration plate.

PRODUCT DATA PLATES

Product data plates must be installed. When markings and placards are missing, unreadable, or not properly installed, mistakes or aircraft damages may occur and could subsequently contribute to a severe failure.

DOCUMENTS TO BE CARRIED ONBOARD

The aircraft certificates and documents necessary for operations must include, but are not limited to each of the following:

- Aircraft Flight Manual
- Certificate of Registration
- Certificate of Airworthiness
- Noise Certificate
- Air Operator Certificate
- Operations Specifications
- Original Radio License
- Technical Log with Aircraft Certificate of Release to Service
- Minimum Equipment List
- Flight Plan
- Mass and Balance

FLIGHT MANUAL

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

Figure 5-3. An airspeed indicator includes colored markings around its perimeter, highlighting important restrictions for which the pilot must be aware.

Figure 5-4. Required emergency exit markings.

Figure 5-5. Required external emergency exit markings.

CERTIFICATE OF REGISTRATION

The certificate of registration is a legal document respecting the certificate of airworthiness. The country of registration's authority allocates a unique alphanumeric string to identify the aircraft and the nationality of the aircraft. The registration must be marked on the exterior of the aircraft as required by the national legislation of the member state of registry.

CERTIFICATE OF AIRWORTHINESS (COA)

Any natural or legal person under whose name and aircraft is registered in the member state of registry shall be eligible as an applicant for an airworthiness certificate. Certificates of Airworthiness (COA) shall be issued to aircraft which conform to a type certificate that has been issued in accordance with this Annex I (Part 21). [**Form 5-4**]

NOISE CERTIFICATE

A noise certificate is issued pursuant to the convention on International Civil Aviation and Regulation EC 216/2008, Article 6 in respect to the aircraft, which is considered to comply with the indicated noise standard when the aircraft is maintained and operated in accordance with the relevant requirements and operating limitations.

Individual aircraft shall be subject to certification and shall be issued with a certificate of airworthiness and a noise certificate. Those certificates shall be issued upon application, when the applicant has demonstrated that the aircraft is in conformity with the design certified and that the aircraft is in condition for safe and environmentally compatible operation. [**Figure 5-6**]

AIR OPERATORS CERTIFICATE

This certificate certifies that an operator is authorized to perform commercial air operations, as defined in the hereafter operations specifications. [**Form 5-1**]

OPERATIONS SPECIFICATIONS

The document specifies the operator's principal place of business, registered name, issue date and signature of the competent authority representative. [**Form 5-2**] Operations specifications are

RÉPUBLIQUE FRANÇAISE

DIRECTION GÉNÉRALE DE L'AVIATION CIVILE

N° 024229

CERTIFICAT DE LIMITATION DE NUISANCES

POUR EXPORTATION

(EXPORT NOISE CERTIFICATE)

1 - Marques de nationalité et d'immatriculation *Nationality & registration marks*	2 - Constructeur et désignation du type de l'aéronef *Manufacturer and designation of aircraft*	3 - Numéro de série de l'aéronef *Aircraft serial number*
	EADS SOCATA Avion SOCATA TB 20	2121

4 - L'aéronef désigné ci-dessus a été examiné, essayé et trouvé *(the above-mentioned aircraft has been examined, tested and found) :*

a) conforme au Certificat de Type de limitation de nuisances : N165
(to conform to French Noise Type Certificate)

b) satisfaisant les exigences techniques de l'Annexe 16 de l'OACI, Volume I, Chapitre : 6
(to comply with the technical requirements of ICAO Annex 16, Volume I, chapter)

5 - Les conditions devant être remplies pour satisfaire aux exigences mentionnées au paragraphe précédent, ainsi que les niveaux de bruit atteints lorsque ces conditions sont satisfaites apparaissent dans le document suivant *(the conditions to be satisfied to comply with the above-mentioned requirements, as well as the noise level data, appear in the following document) :*

Manuel de vol approuvé par la DGAC

Voir également les déclarations complémentaires faites au verso *(see overleaf for complementary information)*

Délivré le : - 3 MAI 2002

pour le Ministre chargé de l'Aviation Civile,

DIRECTION GÉNÉRALE DE L'AVIATION CIVILE SERVICE DE LA FORMATION AÉRONAUTIQUE ET DU CONTRÔLE TECHNIQUE

I.E.E.A.C.
P. AURADE

Ce certificat correspond au certificat acoustique OACI

Figure 5-6. Example of a noise certificate.

subjected to the approved conditions in the operations manual listing the specific approvals like take off and landing, vertical separation minimums and ETOPS.

RADIO LICENSE

The aircraft station license certifies the compliance of the radio transmitting station to an aircraft and radio transmitting of onboard emergency equipment with the radio communications regulations of the International Telecommunication Union. [**Figure 5-7**]

TECHNICAL LOG WITH CERTIFICATE OF RELEASE TO SERVICE

The aircraft technical or journey log is a document specifying the information between pilots (operators) and maintenance personnel. Some following items, where applicable: Registration, date, name(s) of crew member(s), place of departure and arrival, flight time, incidents, observations, signatures, and information relevant to the maintenance recorded in a form other than on paper. Accessibility, usability, and reliability should be assured. [**Figure 5-8**]

REPUBLIQUE FRANÇAISE
DIRECTION GENERALE DE L'AVIATION CIVILE

AIRCRAFT STATION LICENCE
LICENCE DE STATION D'AERONEF
N° 990002666

Conformément au Règlement des radiocommunications annexé à la Convention internationale des télécommunications actuellement en vigueur et au Code de l'Aviation Civile notamment ses articles D 133-19 à D 133-19-10, la présente autorisation est délivrée pour l'installation et pour l'utilisation de l'équipement radioélectrique décrit ci-dessous :

AERONEF	1	2	3	4
	IMMATRICULATION	INDICATIF D'APPEL	TYPE	PROPRIETAIRE
	F-BVXT		F 150 M	Voir Certificat d'Immatriculation

	APPAREILS	a	b	c	d
		Marque et Type	Puissance	Classe d'émission	Bandes de fréquences
5	EMETTEURS		Voir annexe Partie A et additifs éventuels		
6	EMETTEURS D'ENGINS DE SAUVETAGE		Voir annexe Partie A et additifs éventuels		
7	AUTRES APPAREILS		Voir annexe Partie B et additifs éventuels		

Le présent document doit être conservé à bord de l'aéronef. Il a la même validité que le document de navigabilité de l'aéronef. Son titulaire doit se prêter à la vérification des installations par les fonctionnaires des Administrations Françaises et Etrangères compétentes.

Date	Cachet	Signature
Fait à Melun le : 30 Novembre 1998	D.G.A.C. - SERVICE DE LA FORMATION AERONAUTIQUE ET DU CONTROLE TECHNIQUE RADIOELECTRIQUE DE BORD	Pour le Chef du SFACT P.MASTANTUONO

License de Station d'Aéronef (LSA)

C'est une autorisation d'exploiter des dispositifs de radiocommunication installés à bord de l'avion et dont la description est détaillée dans des annexes (voir copie page suivante).

Pas de date de validité apposée mais elle est liée à celle du CEN (Certificat d'examen de Navigabilité) de l'avion. Par ailleurs la licence (LSA) est valable tant que les dispositifs décrits restent en place et ne sont pas frappés d'interdiction par exemple suite à une évolution de la réglementation.

La LSA se retrouvera en pratique revalidée tous les 4 ans (puisque le CEN* est prorogeable 3 fois) et les annexes A & B seront regroupées en un seul document ne mentionnant que les appareils EMETTEURS.

Sur le plan technique le matériel radio électrique se trouve maintenant totalement intégré dans le programme général d'entretien de l'avion.

Figure 5-7. Example of Station license.

MINIMUM EQUIPMENT LIST

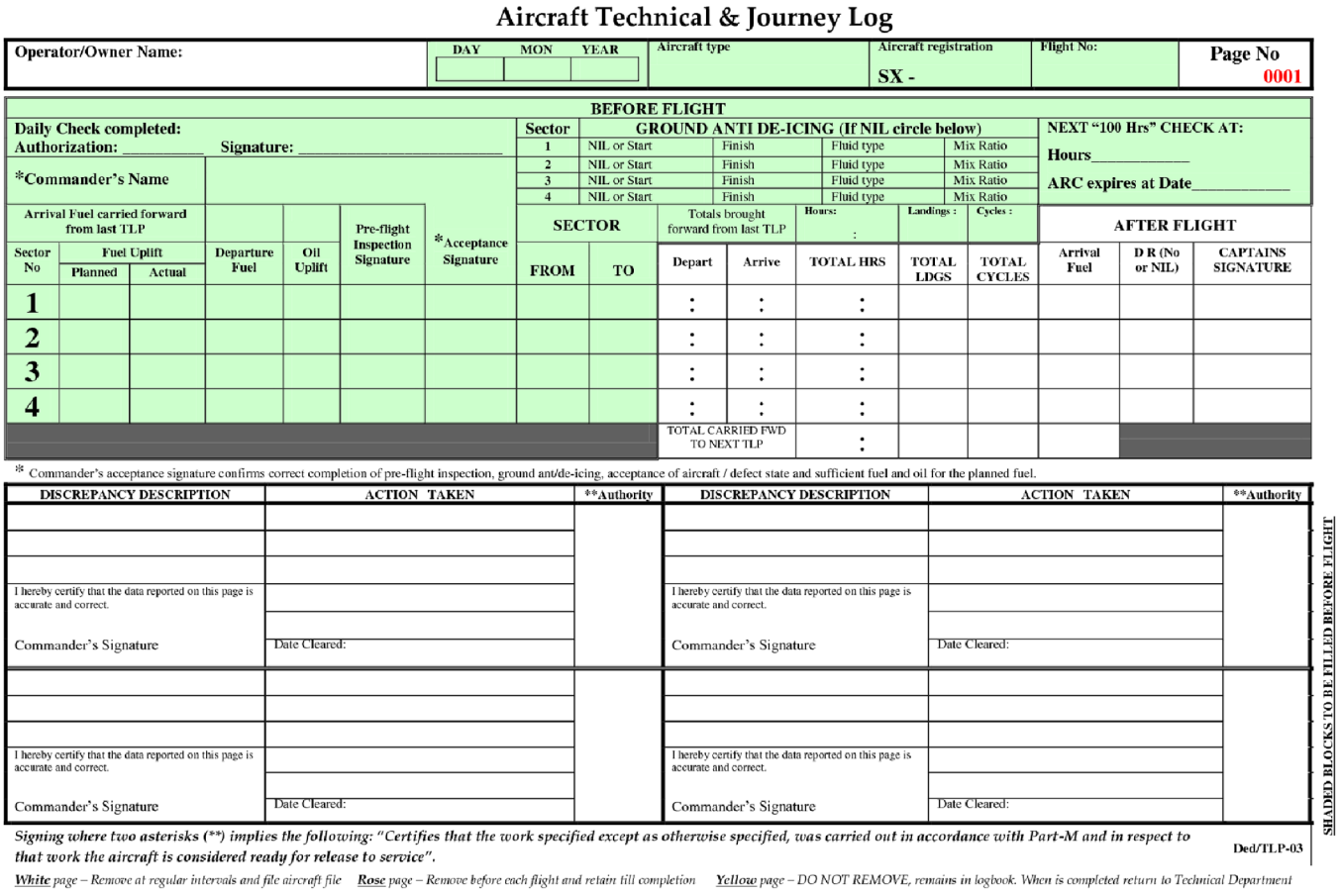
Please refer to previous discussion on *page 5.7*.

FLIGHT PLAN

The purpose of a flight plan is to provide air traffic control services with precise information concerning a flight or a portion of a flight planned by an aircraft. Consequently, a filed flight plan will include all the relevant information relating to the planned flight.

MASS AND BALANCE FORM

Please refer to *Submodule 6*.



Aircraft Technical & Journey Log

Operator/Owner Name:	DAY	MON	YEAR	Aircraft type	Aircraft registration	Flight No:	Page No
					SX -		0001

BEFORE FLIGHT

Daily Check completed: Authorization: _____ Signature: _____

*Commander's Name

Sector	GROUND ANTI DE-ICING (If NIL circle below)			
1	NIL or Start	Finish	Fluid type	Mix Ratio
2	NIL or Start	Finish	Fluid type	Mix Ratio
3	NIL or Start	Finish	Fluid type	Mix Ratio
4	NIL or Start	Finish	Fluid type	Mix Ratio

NEXT "100 Hrs" CHECK AT: Hours_____ ARC expires at Date_____

Sector No	Fuel Uplift Planned	Fuel Uplift Actual	Arrival Fuel carried forward from last TLP	Departure Fuel	Oil Uplift	Pre-flight Inspection Signature	*Acceptance Signature	SECTOR FROM	SECTOR TO	Totals brought forward from last TLP: Depart	Arrive	TOTAL HRS (Hours: :)	TOTAL LDGS (Landings :)	TOTAL CYCLES (Cycles :)	AFTER FLIGHT: Arrival Fuel	D R (No or NIL)	CAPTAINS SIGNATURE
1										:	:	:					
2										:	:	:					
3										:	:	:					
4										:	:	:					
										TOTAL CARRIED FWD TO NEXT TLP		:					

* Commander's acceptance signature confirms correct completion of pre-flight inspection, ground ant/de-icing, acceptance of aircraft / defect state and sufficient fuel and oil for the planned fuel.

DISCREPANCY DESCRIPTION	ACTION TAKEN	**Authority	DISCREPANCY DESCRIPTION	ACTION TAKEN	**Authority
I hereby certify that the data reported on this page is accurate and correct. Commander's Signature	Date Cleared:		I hereby certify that the data reported on this page is accurate and correct. Commander's Signature	Date Cleared:	
I hereby certify that the data reported on this page is accurate and correct. Commander's Signature	Date Cleared:		I hereby certify that the data reported on this page is accurate and correct. Commander's Signature	Date Cleared:	

SHADED BLOCKS TO BE FILLED BEFORE FLIGHT

Signing where two asterisks (**) implies the following: "Certifies that the work specified except as otherwise specified, was carried out in accordance with Part-M and in respect to that work the aircraft is considered ready for release to service".

Ded/TLP-03

White page – Remove at regular intervals and file aircraft file Rose page – Remove before each flight and retain till completion Yellow page – DO NOT REMOVE, remains in logbook. When is completed return to Technical Department

Figure 5-8. An example of an aircraft flight log.

AIR OPERATOR CERTIFICATE
(Approval schedule for air operators)

Types of operation: Commercial air transport(CAT) □ Passengers; □ Cargo;
□ Other[1]**:……..**
Commercial specialised operations (SPO) □[2]**……..**

5	State of the Operator[3]	[5]
	Issuing Authority[4]	
AOC #[6]:	Operator Name[7]	Operational Points of Contact:[9]
	Dba Trading Name[8]	Contact details, at which operational management can be contacted without undue delay, are listed in .....[12] .
	Operator address[10]:	
	Telephone[11]:	
	Fax:	
	E-mail:	
This certificate certifies that ……..[13] is authorised to perform commercial air operations, as defined in the attached operations specifications, in accordance with the operations manual, Annex IV to Regulation (EC) No 216/2008 and its Implementing Rules .		
Date of issue[14]:	Name and Signature[15]:	
	Title:	

Form 5-1. EASA Form 138 Issue 1 (App. I of Part ARO).

OPERATIONS SPECIFICATIONS
(subject to the approved conditions in the operations manual)

Issuing Authority Contact Details

Telephone[1]: _____; Fax: _____;

E-mail: _____

AOC#[2]: Operator Name[3]: Date[4]: Signature:
Dba Trading Name
Operations Specifications#:

Aircraft Model[5]:

Registration Marks[6]:

Commercial operations ☐……..

Area of operation[7]:

Special Limitations[8]:

Specific Approvals:	Yes	No	Specification[9]	Remarks
Dangerous Goods	☐	☐		
Low Visibility Operations Take-off Approach and Landing Take-off	 ☐ ☐	 ☐ ☐	RVR[11]: m CAT[10].... RVR: m DH: ft	
RVSM[12] ☐ N/A	☐	☐		
ETOPS[13] ☐ N/A	☐	☐	Maximum Diversion Time[14]: min.	
Navigation specifications for PBN Operations[15]	☐	☐		[16]
Minimum navigation performance specification	☐	☐		
Helicopter operations with the aid of night vision imaging systems	☐	☐		
Helicopter hoist operations	☐	☐		
Helicopter emergency medical service operations	☐	☐		
Cabin crew training[17]	☐	☐		
Issue of CC attestation[18]	☐	☐		
Continuing airworthiness	☐	☐	[19]	
Others[20]				

Form 5-2. EASA Form 139 Issue 1 (App. II of Part ARO).

MASTER MINIMUM EQUIPMENT LIST

Aircraft applicability: Aeroplanes & Helicopters

ATA Chapter: 23 Communications					
(1) System & Sequence Numbers ITEM		(2) Rectification Interval	(3) Number installed	(4) Number required for dispatch	(5) Remarks or Exceptions
23-10-2	Audio Selector Panel				
23-10-2A		D	-	-	Any in excess of one for each required crew member on flight crew compartment duty may be inoperative.
23-10-2B		D	-	-	May be inoperative provided: (a) The flight is conducted under VFR, and (b) Required communication can be ensured using alternate means.
23-10-2-1	Press To Transmit (PTT) Switch				
23-10-2-1A		B	-	-	(M) Any in excess of one for each required flight crew member may be inoperative provided the affected switch is either verified failed open (non-transmitting) or is deactivated. **Procedures** (M) Check of the failure of the switch in open (non-transmitting) position or deactivation in open position.

Form 5-3. A blank MMEL indicating each item's system, component, function and rectification interval.

Competent authority LOGO

CERTIFICATE OF AIRWORTHINESS

(1)	[Member State of registry] [COMPETENT AUTHORITY OF THE MMBER STATE]	(2)
1. Nationality and registration marks	2. Manufacturer and manufacturer's designation of aircraft.	3. Aircraft serial number
4. Categories		
5. This Certificate of Airworthiness is ussued pursuant to the Convention on International Civil Aviations dated 7 December 1944 and Regulation (EC) No 216/2008, Article 5(2)(c) in respect of the abovementioned aircraft which is considered to be airworthy when maintained and operated in accordance with the foregoing and the pertinent operating limitations. Limitations/Remark: (3) Date of issue: Signature:		
6. This Certificate of Airworthiness is valid unless revoked by the competent authority of the Member State of registry. A current Airwothiness Review Certificate shall be attached to this certificate.		

EASA Form 25 Issue 2.

This certficicate shall be carried on board during all flights

(1) For use by the State of Registry.
(2) For use by the State of Registry.
(3) For use by the State of Registry.

Form 5-4. EASA Form 25 (Certificate of Airworthiness).

This page was intentionally left blank.

Question 5-1
Who is responsible for the continuing airworthiness of an aircraft?

Question 5-2
For what aircraft type(s) is it required for the owner or operator to have a written contract with a CAMO provider?

Question 5-3
In what circumstance may an aircraft owner perform certain maintenance tasks themselves?

Question 5-4
What specialized equipment is required for qualification of "Performance Based Navigation"?

Question 5-5
In what circumstances do Extended Diversion Time Operations (EDTO) regulations take effect?

Question 5-6
In what circumstance may an airplane fly if an item on the Master Minimum Equipment List (MMEL) is inoperative.

Question 5-7
In what circumstance may an airplane fly if a part listed on the Configuration Deviation List is missing or inoperative?

Question 5-8
Where can you find information regarding the required markings and placards on a specific aircraft.

Question 5-9
What is the primary consideration when issuing a Certificate of Airworthiness (COA)?

SUBMODULE 5 PRACTICE ANSWERS

Answer 5-1
The aircraft owner.

Answer 5-2
Aircraft over 5 700 kg maximum takeoff mass and multi engine helicopters.

Answer 5-3
When the aircraft is not used for commercial purposes.

Answer 5-4
There is no specified equipment; only the requirement that the required tasks can be accomplished.

Answer 5-5
When an aircraft's route takes it further than 60 minutes from a suitable alternate landing site.

Answer 5-6
Never. In no circumstances.

Answer 5-7
If a flight manual supplement for operation with that missing part is published and present.

Answer 5-8
The type certificate data sheets.

Answer 5-9
That the individual aircraft conforms to its type certificate.

Certification of Aircraft, Parts, and Appliances

Submodule 6

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		A1
10.6	**Certification of Aircraft, Parts, and Appliances** Basic understanding of Part 21 and of the following EASA certification specifications: CS-22, CS-23, CS-25, CS-27, CS-29, and CS-STAN.	2

10.6 - CERTIFICATION OF AIRCRAFT, PARTS, AND APPLIANCES

DEFINITIONS IMPORTANT FOR THIS SUBMODULE

Airworthy	Airworthy means the aircraft conforms to its type design and is in a condition for safe operation.
Aircraft Maintenance Program (AMP)	A document which describes or incorporates by reference the specific scheduled maintenance tasks and their frequency of completion, the associated maintenance procedures and related standard maintenance practices necessary for the safe operation of those aircraft to which it applies
Continuing Airworthiness (C-A)	All the processes ensuring that, at any time in its operating life, the aircraft complies with the airworthiness requirements in force and is in a condition for safe operation.
Part 21	Means the requirements and procedures for the certification of aircraft and related products, parts and appliances, and of design and production organizations.
Part CAMO Vs Part M/ Sub-G	Organizations that hold a valid (until 24.Sept 2021) Part M Subpart G Approval shall apply to the competent authority for an approval certificate in accordance with Annex Vc (Part-CAMO). The establishment of a Safety Management System (SMS) is mandatory within organizations Part-CAMO managing the C-A of CMPA and / or operated in CAT under license 1008/2008.
Part CAO Vs Part M/Sub-F	C-A Management and Maintenance can be carried out in a single organization CAO (Combined Airworthiness Organization), or one of these two privileges can be exercised independently for Non-complex aircraft and not operated Commercial Air Transport under 1008/2008 license. Organizations that hold a valid (until 24.Sept 2021) Part M Subpart F Approval shall apply to the competent authority for an approval certificate in accordance with Annex Vd (Part-CAO).
Part M (Annex I)	Technical requirements in terms of C-A management and maintenance for non-light aircraft and/or operating in Commercial Air Transport (CAT) under 1008/2008 license. CAMO may issue Airworthiness Review Certificate and Permit to Fly.
Part M-L (LIGHT) (Annex Vb)	The requirements of Part-ML shall apply to the following other than CMPA not listed in the air operator certificate of an air carrier under 1008/2008 license: - Aeroplanes of 2 730 kg maximum take-off mass (MTOM) or less; - Rotorcraft of 1 200 kg MTOM or less, certified for a maximum of up to 4 occupants; - Other ELA2 aircraft.

CMPA = Complex Motor-Powered Aircraft Criteria		
	AIRPLANE	**HELICOPTER**
MTOM (Maximum Take-Off Mass)	5 700 kgs or	3 175 kgs or
Passenger Seating (Certificated for a max passenger seating configuration of more than)	19 or	9 or
Pilot(s) (Certificated for operation with a minimum crew of at least)	2 Pilots or	2 Pilots or
Engines	Equipped with (a) turbojet engine(s) or more than 1 turboprop engine.	A tilt rotor aircraft.
Light Aircraft	(a) Aeroplanes up to 2 730 kg MTOM; (b) Rotorcraft up to 1 200 kg MTOM/max 4 occupants; (c) And other ELA2 (European Light Aircraft). - Aeroplanes with a MTOM of 2 000 kg or less or; - Sailplane or powered sailplane of 2 000 kg MTOM or less or; - Balloon; - Very light rotorcraft.	

CERTIFICATION SPECIFICATIONS

Certification Specifications (CS) are large documents which define the requirements and capabilities of aircraft in each category. The content of a CS can be summed up as follows:

- Performances (e.g. climb gradients one engine inoperative) and handling qualities (e.g. static and dynamic stability, control force, etc.)
- Structure (e.g. gusts envelope, maneuvers envelope, fatigue requirements, etc.)
- Design and Construction (e.g. emergency evacuation provisions; fire protection, etc.)
- Powerplant Installation (e.g. uncontained powerplant failure, fuel and oil system requirements, etc.)
- Systems and Equipment (e.g. systems safety analyses; requirements for electrical, hydraulic and pneumatic systems; required equipment for flight and navigation, etc.)
- Manuals and limitations (e.g. speed limitations, flight manual, continued airworthiness manual, etc.)

These requirements usually prevent unsafe conditions (e.g., performance requirements with one engine that is inoperative). However some have been written to limit the consequences of such unsafe conditions (e.g. emergency evacuation to allow passengers escaping after a minor crash). Other requirements may be performance oriented (e.g. CS 25.1309 that broadly requires an inverse relationship between the probability of a failure and its consequences) when others may impose design constraints (e.g. CS 25.807 that defines the required number and types of emergency exist versus number of passengers). The following are examples of certification specification categories.

CS 22 – SAILPLANES AND POWERED SAILPLANES

This Airworthiness Code is applicable to sailplanes and powered sailplanes in the utility U and aerobatic A categories:

- Sailplanes: the maximum weight of which does not exceed 750 kg;
- Single engine (spark or compression ignition) powered sailplanes: the design value weight to wing span ratio is not greater than three and the maximum weight of which does not exceed 850 kg;
- Sailplanes and powered sailplanes: the number of occupants of which does not exceed two.

Those requirements in CS 22 which apply only to powered sailplanes are marginally annotated with the letter P. Requirements not so marked apply both to sailplanes and to powered sailplanes with engines stopped and engine or propeller retracted where appropriate. In these requirements the word 'sailplane' means both sailplane and powered sailplane. Unless specifically stated otherwise, the term 'powered sailplane' includes those powered sailplanes which may be incapable of complying with CS 22.51 and/or CS 22.65(a) and which must consequently be prohibited from taking off solely by means of their own power by a limitation in the flight manual. These are referred to in the text as self sustaining powered sailplanes of which the additional requirements in Appendix I are applicable. [**Figure 6-1**]

CS 23 – NORMAL UTILITY AEROBATIC AND COMMUTER AIRPLANES

This airworthiness code is applicable to:

- Airplanes in the normal, utility and aerobatic categories that have a seating configuration, excluding the pilot seat(s), of nine or fewer and a maximum certificated take off weight of 5 670 kg (12 500 lb) or less.
- Propeller driven twin engine airplanes in the commuter category that have a seating configuration, excluding the pilot seat(s) of nineteen or fewer and a maximum certificated take off weight of 8 618 kg (19 000 lb) or less. [**Figure 6-2**]

CS 25 – LARGE AIRPLANES

This airworthiness code is applicable to airplanes powered with turbine engines: [**Figure 6-3**]

- Without contingency thrust ratings, and
- For which it is assumed that thrust is not increased following engine failure during takeoff except as specified in sub-paragraph (c).

In the absence of an appropriate investigation of operational implications these requirements do not necessarily cover;

- Automatic landings.

- Approaches and landings with decision heights of less than 60 m (200 ft).
- Operations on unprepared runway surfaces.

If the airplane is equipped with an engine control system that automatically resets the power or thrust on the operating engine(s) when any engine fails during take off, additional requirements pertaining to airplane performance and limitations and the functioning and reliability of the system, contained in Appendix I, must be complied with.

CS 27 – SMALL ROTORCRAFT

This airworthiness code is applicable to small rotorcraft with maximum weights of 3 175 kg (7 000 lbs) or less and nine or less passenger seats. Multi engine rotorcraft may be type certificated as Category A provided the requirements referenced in Appendix C are met. [**Figure 6-4**]

CS 29 - LARGE ROTORCRAFT

This airworthiness code is applicable for large rotorcraft. Large rotorcraft must be certificated in accordance with either the Category A or Category B requirements. [**Figure 6-5**]

A multi engine rotorcraft may be type certificated as both Category A and Category B with appropriate and different operating limitations for each category.

- Rotorcraft with a maximum weight greater than 9 072 kg (20 000 pounds) and 10 or more passenger seats must be type certificated as Category A rotorcraft.
- Rotorcraft with a maximum weight greater than 9 072 kg (20 000 pounds) and nine or less passenger seats may be type certificated as Category B rotorcraft provided the Category A requirements of Subparts C, D, E, and F are met.
- Rotorcraft with a maximum weight of 9 072 kg (20 000 pounds) or less but with 10 or more passenger seats may be type certificated as Category B rotorcraft provided the Category A requirements of CS 29 and of subparts C, D, E, and F are met.
- Rotorcraft with a maximum weight of 9 072 kg (20 000 pounds) or less and nine or less passenger seats may be type certificated as Category B rotorcraft.

Figure 6-3. Large aircraft.


Figure 6-1. CS VLA airplane.


Figure 6-4. Small rotorcraft.


Figure 6-2. Normal, utility aerobatic and commuter airplanes.

Figure 6-5. Large rotorcraft.

CS VLA – VERY LIGHT AIRPLANES

This airworthiness code is applicable to airplanes with a single engine (spark or compression ignition) having not more than two seats, with a maximum certificated take off weight of not more than 750 kg and a stalling speed in the landing configuration of not more than 83 km/h (45 knots) calibrated airspeed, to be approved for day VFR only. [**Figure 6-6**]

CS STAN – STANDARD CHANGES AND REPAIRS

CS STAN is the new concept for standard changes and repairs introduced by EASA in 2015. It provides a cost effective and faster route to installing avionics in non-complex EASA aircraft. This means that certain modifications and repairs are pre-approved by EASA. This standard changes can then be made to the aircraft, without the need for further design certification; it can also be used to support standard repairs. Changes and repairs can then be implemented by maintenance license holders (Part 66 license) under certain conditions which are defined in CS STAN.

As an example with CS STAN you can install a tablet with a moving map display on the aircraft, as long as it is not connected to any essential equipment and it is not used as the primary means of navigation. This is about giving the ability to use technologies that already exist without the need to go through a certification or approval process.

The application of standard changes under CS STAN can be made on aeroplanes up to 5 700 kg MTOM and helicopters up to 3 175 kg. Other examples of this work include:

- Installation of VHF voice communication system.
- Installation of antennas.
- Installation of "FLARM" equipment (collision avoidance system for general aviation).
- Installation of an angle of attack indicator system.
- Installation of certain lights.
- Acceptance of well known references for the design of common repairs.

All these changes are already approved by EASA for the entirety of all types and only require M.A.801 or ML.A.801 approval by a Part 66 licensed inspector. However, in addition to many possibilities, there are two major limitations to standard changes for which a change according to CS STAN is not possible or only possible with restrictions.

Figure 6-6. Sailplanes and powered sailplanes.

A major limitation in the application of CS STAN arises from the fact that no extension of flight operating limitations may occur with a change under CS STAN. This means, for example, that an airplane that is not certificated for night or instrument flight may not be operated under these flight rules with equipment in installed and certifiable in accordance with CS STAN. It also means that equipment installed under CS STAN may be limited in its certification.

A second important limitation in use arises from the fact that no airworthiness directive may be waived or circumvented by a modification or repair in accordance with CS STAN. If an AD exists, only the instructions of that AD are to be followed. Ultimately, the restriction is that neither a standard modification nor a standard repair may conflict with the aircrafts manufacturer's instructions.

PRODUCTION ORGANIZATION APPROVAL

APPROVAL REQUIREMENTS (21A.145)

The production organization shall demonstrate, on the basis of the information submitted in accordance with 21A.143 that:

a. With regard to general approval requirements, facilities, working conditions, equipment and tools, processes and associated materials, number and competence of staff, and general organization are adequate to discharge obligations under 21A.165.
b. With regard to all necessary airworthiness, noise, fuel venting and exhaust emissions data:
   - The production organization is in receipt of such data from the Agency, and from the holder of, or applicant for, the type certificate, restricted type certificate or design approval, to determine conformity with the applicable design data.
   - The production organization has established a procedure to ensure that airworthiness, noise, fuel venting and exhaust emissions data are correctly incorporated in its production data.
   - Such data are kept up to date and made available to all personnel who need access to such data to perform their duties.
c. With regard to management and staff: A manager has been nominated by the production organization, and is accountable to the competent authority. His or her responsibility within the organization shall consist of ensuring that all production is performed to the required standards and that the production organization is continuously in compliance with the data and procedures identified in the exposition referred to in 21A.143.
   - A person or group of persons have been nominated by the production organization to ensure that the organization is in compliance with the requirements of this Part, and are identified, together with the extent of their authority. Such person(s) shall act under the direct authority of the accountable manager referred to in subparagraph.
   - The persons nominated shall be able to show the appropriate knowledge, background and experience to discharge their responsibilities.

- Staff at all levels have been given appropriate authority to be able to discharge their allocated responsibilities and that there is full and effective coordination within the production organization in respect of airworthiness, noise, fuel venting and exhaust emission data matters.

d. With regard to certifying staff, authorized by the production organization to sign the documents issued under 21A.163 under the scope or terms of approval:
   - The knowledge, background (including other functions in the organization), and experience of the certifying staff are appropriate to discharge their allocated responsibilities.
   - The production organization maintains a record of all certifying staff which shall include details of the scope of their authorization.
   - Certifying staff are provided with evidence of the scope of their authorization.

PRIVILEGES (21A.163)

Pursuant to the terms of approval issued under 21A.135, the holder of a production organization approval may:

a. Perform production activities under this Part.
b. In the case of complete aircraft and upon presentation of a statement of conformity (EASA Form 52) under 21A.174, obtain an aircraft certificate of airworthiness and a noise certificate without further showing. [**Form 6-1**]
c. In the case of other products, parts or appliances issue authorized release certificates (EASA Form 1) under 21A.307 without further showing.
d. Maintain a new aircraft that it has produced and issue a certificate of release to service (EASA Form 53) in respect of that maintenance.

OBLIGATIONS OF THE HOLDER (21A.165)

The holder of a production organization approval shall:

a. Ensure that the production organization exposition furnished in accordance with 21A.143 and the documents to which it refers, are used as basic working documents within the organization.
b. Maintain the production organization in conformity with the data and procedures approved for the production organization approval.
c. Determine that:
   - Each completed aircraft conforms to the type design and is in condition for safe operation prior to submitting statements of conformity to the competent authority;
   - Other products, parts or appliances are complete and conform to the approved design data and are in condition for safe operation before issuing EASA Form 1 to certify airworthiness, and additionally in case of engines, determine according to data provided by the engine type certificate holder that each completed engine is in compliance with the applicable emissions requirements as defined in 21A.18 (b), current at the date of manufacture of the engine, to certify emissions compliance.
   - Other products, parts or appliances conform to the applicable data before issuing EASA Form 1 as a conformity certificate.

DURATION AND CONTINUED VALIDITY (21A.159)

a. A production organization approval shall be issued for an unlimited duration. It shall remain valid unless:
   - The production organization fails to demonstrate compliance with the applicable requirements of this Subpart.
   - The competent authority is prevented by the holder or any of its partners or subcontractors to perform the investigations in accordance with 21A.157.
   - There is evidence that the production organization cannot maintain satisfactory control of the manufacture of products, parts or appliances under the approval.
   - The production organization no longer meets the requirements of 21A.133.
   - The certificate has been surrendered or revoked under 21B.245.
b. Upon surrender or revocation, the certificate shall be returned to the competent authority.

DESIGN ORGANIZATION APPROVAL

PART 21 – SUBPART J

This Subpart establishes the procedure for the approval of design organizations and rules governing the rights and obligations of applicants for, and holders of such approvals. [**Figure 6-7**]

APPROVAL REQUIREMENTS (21A.245)

The design organization shall demonstrate, on the basis of the information submitted in accordance with 21A.243 that, in addition to complying with 21A.239:

a. The staff in all technical departments are of sufficient numbers and experience and have been given appropriate authority to be able to discharge their allocated responsibilities and that these, together with the accommodation, facilities and equipment are adequate to enable the staff to achieve the airworthiness, noise, fuel venting and exhaust emissions objectives for the product.
b. There is full and efficient coordination between departments and within departments in respect of airworthiness and environmental protection matters.

PRIVILEGES (21A.263)

c. The holder of a design organization approval shall be entitled to perform design activities under this Part and within its scope of approval.
d. Subject to 21A.257(b), compliance documents submitted by the applicant for the purpose of obtaining:
   - A type certificate or approval of a major change to a type design.
   - A supplemental type certificate.
   - An ETSO (European Technical Standard Orders) authorization under 21A.602 (b) (1.).
   - A major repair design approval; shall be accepted by the Agency without further verification.
e. The holder of a design organization approval shall be entitled, within its terms of approval and under the relevant procedures of the design assurance system:

- To classify changes to type design and repairs as 'major' or 'minor'.
- To approve minor changes to type design and minor repairs.
- To issue information or instructions containing the following statement: 'The technical content of this document is approved under the appropriate EASA authority.
- To approve documentary changes to the aircraft flight manual, and issue such changes containing the following statement: 'Revision nr. xx to AFM ref. yyy, is approved under the appropriate EASA authority.
- To approve the design of major repairs to products for which it holds the type certificate or the supplemental type certificate.

DURATION AND CONTINUED VALIDITY (21A.259)

a. A design organization approval shall be issued for an unlimited duration. It shall remain valid unless:
   - The design organization fails to demonstrate compliance with the applicable requirements of this Subpart.
   - The Agency is prevented by the holder or any of its partners or subcontractors to perform the investigations in accordance with 21A.257.
   - There is evidence that the design assurance system cannot maintain satisfactory control and supervision of the design of products or changes thereof under the approval.
   - The certificate has been surrendered or revoked under the applicable administrative procedures established by the Agency.

b. Upon surrender or revocation, the certificate shall be returned to the Agency.

DOCUMENTS

TYPE CERTIFICATES

SCOPE

A type certificate is issued to signify the airworthiness of an aircraft manufacturing design. The certificate is issued by a regulating body, and once issued, the design cannot be changed. The certificate reflects a determination made by the regulating body that the aircraft is manufactured according to an approved design, and that the design ensures compliance with airworthiness requirements. The regulating body compares design documents and processes to determine if the design meets requirements established for the type of equipment. Once issued, the aircraft "type" meets appropriate requirements. The determination process includes a step called "First Article Inspection", for it and for each of its subassemblies. This is a quality control assessment whereas those prior to it are part of quality assurance.

With respect to "*cannot be changed*"; when a technician wants to change something there are two options. One is to request a Supplemental Type Certificate (STC), the other is to create an entirely different design. The choice is determined by considering whether or not the change constitutes a new design (i.e., introduces risk not considered in the first design). If the manufacturer believes the change doesn't introduce new risks, the manufacturer typically requests an STC. This is less expensive. If the regulatory authority agrees with the rationale for choosing STC, the STC is granted.

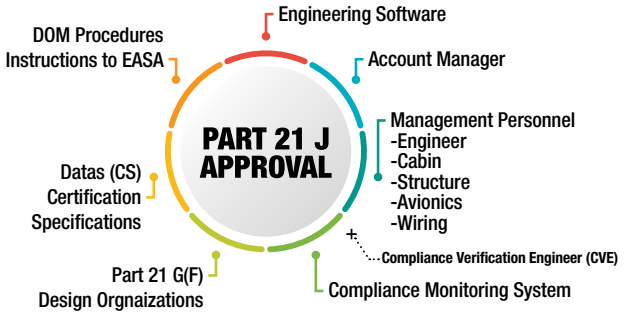


Figure 6-9. The typical organizational structure of a Design Organization.

The Type Certificate (TC) implies that aircraft manufactured according to the approved design can be issued an airworthiness certificate. Examples of regulatory authorities are national aviation authorities (NAAs) and EASA. To meet those requirements the aircraft and each sub-assembly must also be approved. When aircraft are produced to meet a given TC, each one need not be tested as rigorously but the confidence demonstrated by the TC is conferred, when the aircraft has been assigned an airworthiness certificate. [**Figure 6-8**]

An "Airworthiness Certificate" is issued for each aircraft that is properly registered if it conforms to its type design.

The airworthiness certificate is valid and the aircraft may be operated as long as it is maintained in accordance with the rules issued by the regulatory authority.

VALIDITY

The type certificate holder keeps the type certificate valid by continuously following airworthiness directives, issuing service bulletins and by providing spares and technical support to keep the aircraft current with the prevailing rules, even after the production of the type has stopped. This is what is meant by supporting the type and in this manner many out of production aircraft continue useful lives. STCs are also bound by the same rules. When the holder decides to stop supporting the aircraft type, the type certificate is returned to the regulators and the remaining aircraft fleet is permanently grounded. In this manner the whole Concorde fleet was finally grounded when Airbus surrendered its type certificate.

SUPPLEMENTAL TYPE CERTIFICATES

A supplemental type certificate is issued following a modification. The STC defines the product design change, states how the modification affects the existing type design, and lists serial number affectivity. It also identifies the certification basis listing specific regulatory compliance for the design change. Information contained in the certification basis is helpful for those applicants proposing subsequent product modifications and evaluating certification basis compatibility with other STC modifications. [**Figure 6-9**]

Initially, the applicant firm submits documents to their local aviation regulating body, detailing how the proposed design, i.e., the 'Type', would fulfill the airworthiness requirements. After investigations by the regulator, the final approval of such documents (after the required comments and amendments in order to fulfill the laws), becomes the basis of the certification. The firm follows it and draws a proposed timetable of actions required for certification tests. With the application, the regulations to be applied will usually be frozen for this application for a given amount of time in order to avoid a situation where the applicant would have to change the design as a result of changed regulation.

An initial design sample known as a prototype is built. This refers to either the aircraft, the engines or the propeller, depending on the basis of the certification. For the purpose of illustration, the discussion shall be limited to the aircraft. Normally a few prototypes are built, each subject to different tests. The prototypes are first used for ground and system tests. One of the prototypes (known as the "static airframe") is subject to destructive testing, i.e., the prototype is subject to stress beyond normal and abnormal operations until destruction. The test results are compared with the initial calculations to establish the ultimate structural strength.

European Aviation Safety Agency

TYPE-CERTIFICATE

EASA.A.006

This certificate, established in accordance with Regulations (EC) No 1592/2002 and (EC) No 1702/2003 and issued to

Costruzioni Aeronautiche TECNAM S.r.l.

Via Tasso, 478
80127 Napoli
Italia

certify that the aircraft type design listed below comply with the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified on the associated Type Certificate Data Sheet N°. A.006

Model	Date of issue
Tecnam P2002-JF	27 May, 2004
Tecnam P2002-JR	02 February, 2007

This certificate and its associated type-certificate data sheet, which is a part thereof, shall remain valid unless otherwise surrendered or revoked.

For the European Aviation Safety Agency,

Roger Hardy
Certification Manager
General Aviation

Figure 6-8. Example of a type certificate.

Other prototypes will undergo other systems tests until the satisfaction of the regulators. With all ground tests completed, prototypes are made ready for flight tests. The flight tests are flown by specially approved flight test pilots who will fly the prototypes to establish the ultimate flight limits which should be within the airworthiness rules. If a long range airliner is tested, the flight tests may cover the whole world.

In parallel with aircraft testing, the applicant firm also draws up maintenance program to support continuous airworthiness after approval of the design. The program is drawn with inputs from tests results and also from initial customers' engineering departments. The proposed maintenance program is submitted to the regulators for comment and approval. After successful completion of ground and flight tests, along with an approved maintenance program, the prototype is approved, and the firm is granted the type certificate for the prototype (as understood that it should include all furnished equipment for its intended role). The legal term for the firm is now the "type certificate holder". Subsequently the prototype now serves as a template for aircraft production. Hence the aircraft rolling out of the factory should be identical to the prototype, and each given a serial number (a series aircraft).

EASA
European Aviation Safety Agency

SUPPLEMENTAL TYPE CERTIFICATE

10051148

This Supplemental Type Certificate is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation and in accordance with Commission Regulation (EU) No. 748/2012 to

ICELANDAIR EHF

(REYKJAVIKURFLUGVELLI)
REYKJAVIK AIRPORT
101 REYKJAVIK
ICELAND

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified below:

Original Type Certificate Number : EASA.IM.A.205
Type Certificate Holder : THE BOEING COMPANY
Type Design - Model : 757-200/-300

Description of Design Change:
Satcom Iridium & Tamdar Sensor installation
[Installation of Antcom Corp. Combined GPS and Dual Iridium Antenna, Sensor System Inc. Combined VHF/WLAN Antenna, Avionica, Inc. Satellite Communication (SatLINK MAX) System and Panasonic Avionics Corporation (PAC) Tropospheric Airborne Meteorological Data Reporting (TAMDAR) System.]

EASA Certification Basis:
The Certification Basis (CB) for the original product remains applicable to this certificate/ approval. The requirements for environmental protection and the associated certified noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

See Continuation Sheet(s)

For the European Aviation Safety Agency,

Date of issue: 12 November 2014

Alain LEROY
Head of Large Aeroplanes Department

Note:
The following numbers are listed on the certificate:
EASA current Project Number: 0010027991-001

SUPPLEMENTAL TYPE CERTIFICATE - 10051148 - ICELANDAIR EHF

1/2

Figure 6-9. Example of a supplemental type certificate.

CERTIFICATES OF AIRWORTHINESS

The Airworthiness Certificates shall be classified as: [**Form 6-2**]

a. Certificates of airworthiness shall be issued to aircraft which conform to a type certificate that has been issued in accordance with this Part.
b. Restricted certificates of airworthiness shall be issued to aircraft:
   - Which conform to a restricted type certificate that has been issued in accordance with this Part.
   - Which have been shown to the Agency to comply with specific certification specifications ensuring adequate safety.
c. Permits to fly shall be issued to aircraft that do not meet, or have not been shown to meet, applicable certification specifications but are capable of safe flight under defined conditions.
d. Each application for a certificate of airworthiness or restricted certificate of airworthiness shall include:

For new aircraft:
- Statement of conformity issued under 21A.163(b) or 21A.130 and is validated by the competent authority;

For an imported aircraft:
- A statement signed by the exporting authority that the aircraft conforms to a design approved by the Agency, including a weight and balance report with a loading schedule and a flight manual, when required by the applicable airworthiness code for the particular aircraft.

For used aircraft originating from a member state:
- An airworthiness review certificate issued in accordance with Part M.

For used aircraft originating from a member state:
- A statement by the competent authority of the State where the aircraft is, registered, reflecting the airworthiness status of the aircraft on its register at time of transfer.
- A weight and balance report with a loading schedule.
- The flight manual when such material is required by the applicable airworthiness code for the particular aircraft.
- Historical records to establish the production, modification, and maintenance standard of the aircraft, including all
- limitations associated with a restricted certificate of airworthiness under 21A.184(c).
- A recommendation for the issuance of a certificate of airworthiness or restricted certificate of airworthiness and an
- Airworthiness review certificate following an airworthiness review in accordance with Part M.

An airworthiness certificate shall be issued for an unlimited duration. It shall remain valid subject to:
- Compliance with the applicable type design and continuing airworthiness requirements;
- The aircraft remaining on the same register;
- The type certificate or restricted type-certificate under which it is issued not being previously invalidated under 21A.51.
- The certificate not being surrendered or revoked under 21B.330.

RESTRICTED CERTIFICATES OF AIRWORTHINESS

a. The competent authority of the member state of registry shall issue a restricted certificate of airworthiness for: [**Form 6-3**]
   - New aircraft, upon presentation of the documentation required by 21A.174(b)(2) demonstrating that the aircraft conforms to a design approved by the Agency under a restricted type certificate or in accordance with specific certification specifications, and is in condition for safe operation.
   - Used aircraft, upon presentation of the documentation required by 21A.174(b)(3) demonstrating:
     - The aircraft conforms to a design approved by the Agency under a restricted type certificate or in accordance with specific certification specifications;
     - The applicable airworthiness directives have been complied with;
     - The aircraft has been inspected in accordance with the appropriate provisions of Part M;
     - When the competent authority of the member state of registry is satisfied that the aircraft conforms to the approved design and is in condition for safe operation. This may include inspections by the competent authority of the member state of registry.
b. For an aircraft that cannot comply with the essential requirements referred to in the basic regulation and which is not eligible for a restricted type certificate, the Agency shall, as necessary to take account of deviations from these essential requirements:
   - Issue and check compliance with specific certification specifications ensuring adequate safety with regard to the intended use, and
   - Specify limitations for use of this aircraft.
c. Limitations for use will be associated with restricted certificates of airworthiness including airspace restrictions as necessary to take account of deviations from essential requirements for airworthiness laid down in the basic regulation.

PERMITS TO FLY

The competent authority of the member state of registry shall issue a permit to fly after the Agency has found that the aircraft and appropriate associated restrictions compensating for departure from the essential requirements permit the aircraft to perform safely a basic flight. For that purpose, the Agency may make or require the applicant to make appropriate inspections or tests necessary to ensure safety. [**Figure 6-10**]

AIRCRAFT REGISTRATION

An aircraft registration is a unique alphanumeric string that identifies a civil aircraft, in similar fashion to a license plate on an automobile. In accordance with the Convention on International Civil Aviation, all aircraft must be registered with a national aviation authority and they must carry proof of this registration in the form of a legal document called a Certificate of Registration

at all times when in operation. Most countries also require the aircraft registration to be imprinted on a permanent fireproof plate mounted on the fuselage for the purposes of post fire or post crash aircraft accident investigation.

The first use of aircraft registrations was based on the radio call signs allocated at the London International Radiotelegraphic conference in 1913. This was modified by agreement by the International Bureau at Berne published in 1913. Although initial allocations were not specifically for aircraft but for any radio user, the International Air Navigation Convention held in Paris in 1919 made allocations specifically for aircraft registrations, based on the 1913 call sign list. The agreement stipulated that the nationality marks were to be followed by a hyphen then a group of four letters that must include a vowel (and for the convention Y was considered to be a vowel).

At the International Radiotelegraph Convention at Washington in 1927, the list of markings was revised and adopted from 1928; these allocations are the basis of the currently used registrations. The markings have been amended and added to over the years, and the allocations and standard are managed by ICAO.

CERTIFICATE OF VALIDITY - PERMIT TO FLY

Civil Aviation Authority

United Kingdom
Civil Aviation Authority

Nationality and Registration Marks	Manufacturer and designation of aircraft	Aircraft Serial Number
G-CBSS	INTREPRINDEREA DE AVIOANE BACAU YAK-52	833707

It is hereby confirmed that the above-mentioned aircraft has been examined by the **Civil Aviation Authority** and was found at the time of survey, to be in a satisfactory and airworthy condition.

The Permit to Fly is validated for the period shown below. The next renewal Flight Test is due by **8 June 2014.**

This Certificate forms part of the Civil Aviation Authority Permit to Fly No. **PR054188/008** and is effective

From 11 JUN 2012 To 10 JUN 2013

Signed CIVIL AVIATION AUTHORITY 163 Dated 11 JUN 2012

965 CAA
10082010

Certificate No:
PR054188/008

UNITED KINGDOM
CIVIL AVIATION AUTHORITY
PERMIT TO FLY

Civil Aviation Authority

Nationality and Registration Marks	Constructor and Constructor's Designation of Aircraft	Aircraft Serial Number
G-CBSS	INTREPRINDEREA DE AVIOANE BACAU YAK-52	833707

Engine Type: IVCHENKO VEDENEYEV M-14P
Propeller Type: V530 TA-D35

This Permit to Fly, issued pursuant to the Air Navigation Order, hereby permits this aircraft to fly within United Kingdom airspace only without a Certificate of Airworthiness being in force in respect thereof. This permission for flight within United Kingdom airspace does not constitute a Certificate of Airworthiness issued pursuant to the Convention on International Civil Aviation dated 7 December 1944.

This Permit to Fly is issued subject to the Conditions listed on subsequent pages.

A CERTIFICATE OF VALIDITY FORMS PART OF THIS PERMIT TO FLY

The Certificate of Validity will be issued or renewed by the Civil Aviation Authority upon being satisfied with the design, construction and airworthiness of the aircraft. The Certificate of Validity will remain valid for the period prescribed from the date of issue.

Date: 11 JUN 2012 CIVIL AVIATION AUTHORITY 163 for the Civil Aviation Authority

No entries or endorsements may be made on this Permit or the Certificate of Validity except by an authorised person. If either document is lost, the Civil Aviation Authority should be informed at once. Any person finding these documents should forward them immediately to the Civil Aviation Authority, Safety Regulation Group, Aviation House, Gatwick Airport South, West Sussex, RH6 0YR.
National Permit to Fly - 20111118

Figure 6-10. Examples of permits to fly.

Article 20 of the Chicago Convention on International Civil Aviation requires that all signatory countries register aircraft over a certain weight with a national aviation authority. Upon registration, the aircraft receives its unique "registration", which must be displayed prominently on the aircraft.

Annex 7 to the Convention on International Civil Aviation describes the definitions, location, and measurement of nationality and registration marks.

The aircraft registration is made up of a prefix selected from the country's call sign prefix allocated by the International Telecommunication Union (making the registration a quick way of determining the country of origin) and the registration suffix. Depending on the country of registration, this suffix is a numeric or alphanumeric code, and consists of one to five digits or characters respectively.

The ICAO provides a supplement to Annex 7 which provides an updated list of approved nationality and common marks used by various countries. [**Figure 6-11**]

NOISE CERTIFICATION

The ICAO has stipulated that all aircrafts must comply with certain noise requirements. Aircraft must respect a defined noise threshold. If not they could be forbidden to fly over certain areas. In the past some aircraft equipped with old jet engines had to retrofitted with noise reduction devices (hush kits).

EASA has formalized the noise requirements in certification specifications (CS 36). These requirements make references to the ICAO environmental technical manual on the use of procedures in the noise certification of aircraft, steering group approved revision 7.

For new aircraft, the noise certification is carried out during the type certification process. Noise measurement must be taken from various points and locations prescribed by the regulation. [**Figure 6-12**] There are three measures:

1. Approach measurement.
2. Takeoff measurement.
3. Lateral reference point measurement.

The maximum mass at which the noise compliance has been demonstrated must be stated on the noise certificate.

WEIGHT SCHEDULE

a. An operator shall ensure that during any phase of operation, the loading, mass and center of gravity of the airplane complies with the limitations specified in the approved airplane flight manual, or the operations manual if more restrictive.
b. An operator must establish the mass and the center of gravity of any airplane by actual weighing prior to initial

Figure 6-11. Example of national aircraft registration prefixes; SX for Greece, UP for Kazakhstan, N for United States.

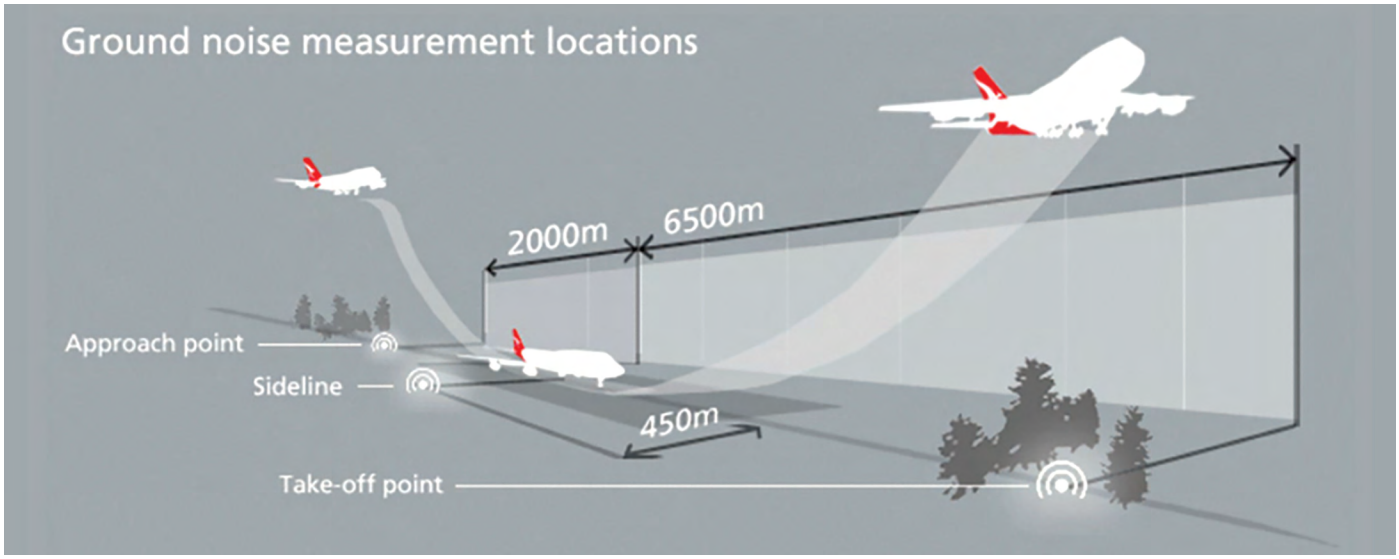


Figure 6-12. Ground noise measurement locations.

entry into service and thereafter at intervals of 4 years if individual airplane masses are used and 9 years if fleet masses are used. The accumulated effects of modifications and repairs on the mass and balance must be accounted for and properly documented. Furthermore, airplanes must be reweighed if the effect of modifications on the mass and balance is not accurately known.

c. An operator must determine the mass of all operating items and crew members included in the airplane dry operating mass by weighing or by using standard masses. The influence of their position on the airplane center of gravity must be determined.
d. An operator must establish the mass of the traffic load, including any ballast, by actual weighing or determine the mass of the traffic load in accordance with standard passenger and baggage masses as specified in OPS 1.620.
e. An operator must determine the mass of the fuel load by using the actual density or, if not known, the density calculated in accordance with a method specified in the operations manual.

MASS AND BALANCE DOCUMENTATION

a. An operator shall establish mass and balance documentation prior to each flight specifying the load and its distribution. The mass and balance documentation must enable the commander to determine that the load and its distribution is such that the mass and balance limits of the airplane are not exceeded. The person preparing the mass and balance documentation must be named on the document. The person supervising the loading of the airplane must confirm by signature that the load and its distribution are in accordance with the mass and balance documentation. This document must be acceptable to the commander, his/her acceptance being indicated by countersignature or equivalent.
b. An operator must specify procedures for last minute changes to the load.
c. Subject to the approval of the Authority, an operator may use an alternative to the procedures required by paragraphs (a) and (b) above.
d. Determination of the dry operating mass of an Airplane;
   - New airplanes are normally weighed at the factory and are eligible to be placed into operation without reweighing if the mass and balance records have been adjusted for alterations or modifications to the airplane. Airplanes transferred from one operator with an approved mass control program to another operator with an approved program need not be weighed prior to use by the receiving operator unless more than 4 years have elapsed since the last weighing.
   - The individual mass and center of gravity (CG) position of each airplane shall be reestablished periodically. The maximum interval between two weighings must be defined by the operator and must meet the requirements of OPS 1.605 (b). In addition, the mass and the CG of each airplane shall be reestablished either by:
     - Weighing;
     - Calculation, if the operator is able to provide the necessary justification to prove the validity of the method of calculation chosen, whenever the cumulative changes to the dry operating mass exceed ±0.5% of the maximum landing mass of the cumulative change in CG position exceeds 0.5% of the mean aerodynamic chord.

Mass and balance documentation must contain the following information: [**Form 6-4**]

- The airplane registration and type.
- The flight identification number and date.
- The identity of the commander.
- The identity of the person who prepared the document.
- The dry operating mass and the corresponding CG of the airplane.
- The mass of the fuel at takeoff and the mass of trip fuel.
- The mass of consumables other than fuel.
- The components of the load including passengers, baggage, freight and ballast.
- Takeoff mass, landing mass and zero fuel mass.
- The load distribution.
- The applicable airplane CG positions.
- The limiting mass and CG values.

RADIO STATION LICENSE AND APPROVAL

The requirement is to have radio licenses originated from the International Telecommunication Union (ITU), an international organization responsible for the management and the allocation of radio frequencies. They are also responsible for the regulation and use of transmitting equipment with a role to ensure they operate within acceptable tolerances. [**Form 6-5**]

The Convention on International Civil Aviation (Article 30) requires that the transmitting equipment be installed and operated in an aircraft in accordance with a radio license and that the radio license be carried on board the aircraft.

The ICAO documents do not provide a detailed listing of the equipment to be mentioned on a radio license. However, all transmitting radio equipment (VHF, HF, ELT, radar, etc.) installed on an aircraft should be covered in the radio license.

Approval will be in accordance with the national authorities regulations for the country of the applicant.

AIRCRAFT STATEMENT OF CONFORMITY		
1 State of manufacture	2 Competent authority of a Member State of the European Union or EASA	3 Statement Ref No
4 Organisation		
5 Aircraft Type	6 Type-certificate Refs:	
7 Aircraft Registration Or Mark	8 Manufacturers Identification No	
9 Engine/Propeller Details*		
10 Modifications and/or Service Bulletins*		
11 Airworthiness Directives		
12 Concessions		
13 Exemptions, Waivers or Derogations*		
14 Remarks		
15 Certificate of Airworthiness		
16 Additional Requirements		
17 Statement of Conformity It is hereby certified that this aircraft confirms fully to the type-certificated design and to the items above in boxes 9, 10, 11, 12 and 13. The aircraft is in a condition of safe operation. The aircraft has been satisfactorily tested in flight.		
18 Signed	19 Name	20 Date (d/m/y)
21 Production Organisation Approval Reference		

EASA Form 52

* Delete as applicable

Form 6-1. A standard Statement of Conformity, in this case issued by the French DGAC.

AIR OPERATOR CERTIFICATE
(Approval schedule for air operators)

Types of operation: Commercial air transport(CAT) □ Passengers; □ Cargo;
□ Other[1]**:……..**
Commercial specialised operations (SPO) □[2]**……..**

5	State of the Operator[3]	[5]
	Issuing Authority[4]	
AOC #[6]:	Operator Name[7]	Operational Points of Contact:[9]
	Dba Trading Name[8]	Contact details, at which operational management can be contacted without undue delay, are listed in .....[12] .
	Operator address[10]:	
	Telephone[11]:	
	Fax:	
	E-mail:	
This certificate certifies that ……..[13] is authorised to perform commercial air operations, as defined in the attached operations specifications, in accordance with the operations manual, Annex IV to Regulation (EC) No 216/2008 and its Implementing Rules .		
Date of issue[14]:	Name and Signature[15]:	
	Title:	

Form 6-2. EASA Form 138 Issue 1 (App. I of Part ARO).

OPERATIONS SPECIFICATIONS
(subject to the approved conditions in the operations manual)

Issuing Authority Contact Details

Telephone[1]: _____; Fax: _____;

E-mail: _____

AOC#[2]: Operator Name[3]: Date[4]: Signature:
Dba Trading Name
Operations Specifications#:

Aircraft Model[5]:

Registration Marks[6]:

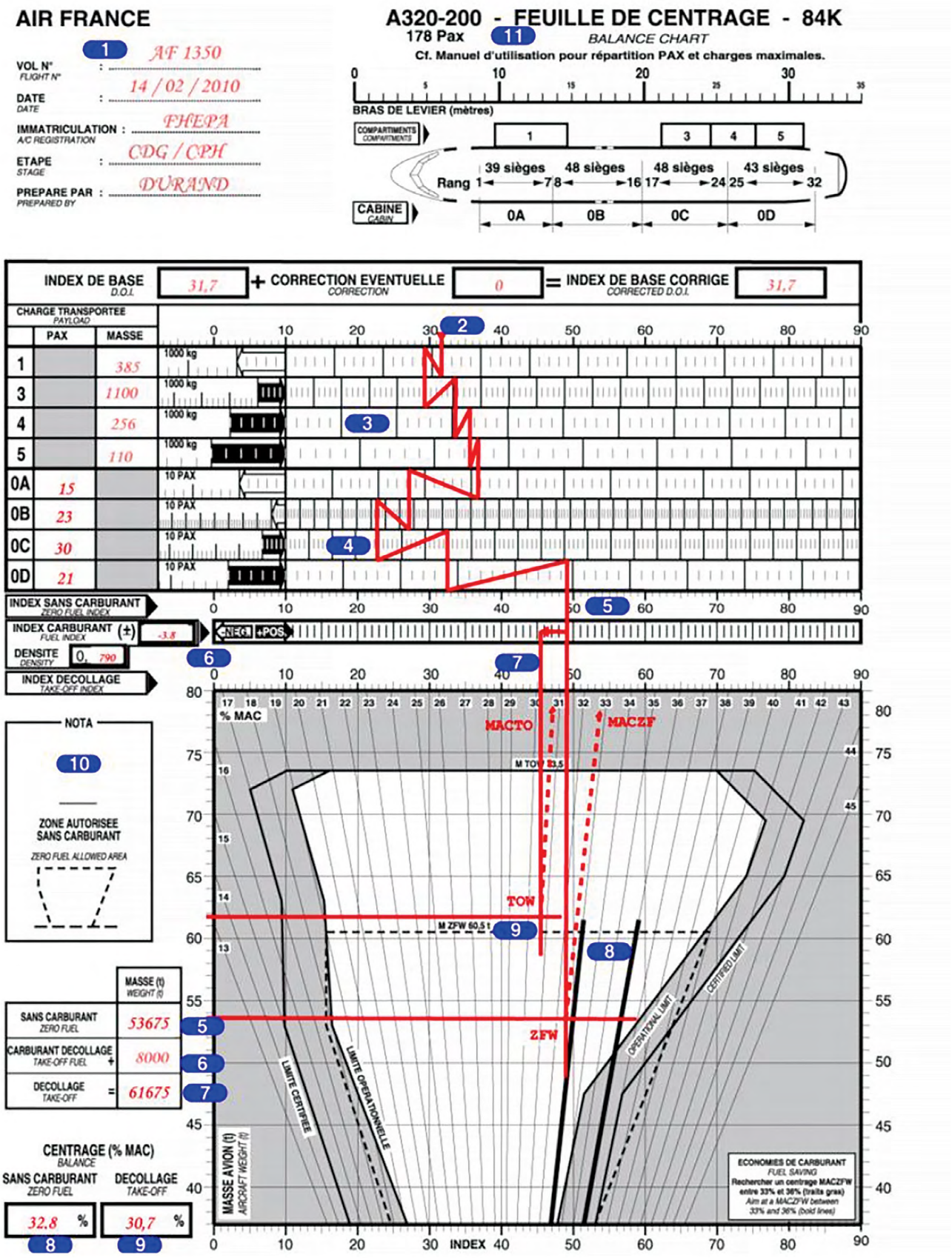
Commercial operations ☐……..

Area of operation[7]:

Special Limitations[8]:

Specific Approvals:	Yes	No	Specification[9]	Remarks
Dangerous Goods	☐	☐		
Low Visibility Operations Take-off Approach and Landing Take-off	 ☐ ☐	 ☐ ☐	RVR[11]: m CAT[10].... RVR: m DH: ft	
RVSM[12] ☐ N/A	☐	☐		
ETOPS[13] ☐ N/A	☐	☐	Maximum Diversion Time[14]: min.	
Navigation specifications for PBNOperations[15]	☐	☐		[16]
Minimum navigation performance specification	☐	☐		
Helicopter operations with the aid of night vision imaging systems	☐	☐		
Helicopter hoist operations	☐	☐		
Helicopter emergency medical service operations	☐	☐		
Cabin crew training[17]	☐	☐		
Issue of CC attestation[18]	☐	☐		
Continuing airworthiness	☐	☐	[19]	
Others[20]				

Form 6-3. EASA Form 139 Issue 1 (App. II of Part ARO).



Form 6-4. Example of Mass and Balance form.

Application for Part 21 Permit to Fly		
1. Applicant:	*[Name of applicant]*	
2. Aircraft nationality and identification marks:		
3. Aircraft owner:		
4. Aircraft manufacturer/type		**5. Serial number**
6. Purpose of flight		
7. Expected target date(s) for the flight(s) and duration		
8. Aircraft configuration as relevant for the permit to fly 8.1 The above aircraft for which a permit to fly is requested is defined in *[add reference to the document(s) identifying the configuration of the aircraft.]* 8.2 The aircraft is in the following situation related to its maintenance schedule: *[Describe status]*		
9. Approval of flight conditions *[if not available at the time of application, indicate reference of request for approval]*		
10. Date		**11. Name and signature** *[Authorised signatory]*

EASA Form 21

Form 6-5. Application for Part 21 Permit to Fly (EASA Form 21).

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Question 6-1
In what document can you find the required capabilities of an aircraft's design? _____

Question 6-2
What are the three limitations of installing equipment under the guidelines of CS STAN?

Question 6-3
What is the result of an aircraft manufacturer surrendering its type certificate?

Question 6-4
What document is required if a manufacturer wants to change some aspect of the aircraft's design?

Question 6-5
What three things are required of a type certificate holder to keep the certificate valid?

Question 6-6
In what circumstances would an aircraft operator request a Permit to Fly?

Question 6-7
Name two factors that can effect the amount of noise generated by an aircraft.

Question 6-8
How often must the mass and balance of an aircraft be checked?

Question 6-9
What pieces of equipment are generally covered by an aircraft's radio station license?

Question 6-10
What do certification specifications CS 27 and CS 29 have in common?

SUBMODULE 6 PRACTICE ANSWERS

Answer 6-1
The Certification Specifications.

Answer 6-2
The installation does not affect the aircraft's published limitations. The installation does not connect to essential equipment. The aircraft's weight does not exceed 5 700 kg MTOM or 3 175 kg if a helicopter.

Answer 6-3
All aircraft of that type are grounded.

Answer 6-4
A supplemental type certificate.

Answer 6-5
Follows Airworthiness Directives (ADs); issues service bulletins when needed; continues to provide spare parts and technical support.

Answer 6-6
If the aircraft does not fully conform to its airworthiness certificate but is deemed safe for a single flight; for example to a repair station.

Answer 6-7
The characteristics of the engine, and the aircraft's mass.

Answer 6-8
Before every flight.

Answer 6-9
Any device which transmits such as radios, transponders, radar, emergency locator transmitters, etc.

Answer 6-10
Both pertain to helicopters; CS 27 for small helicopters and CS 29 for large ones.

Continuing Airworthiness

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		A1
10.7	**Continuing Airworthiness** General understanding of the Part 21 requirements on continuing airworthiness; General understanding of Part-M, Part-ML and Part-CAMO; Aircraft Maintenance Programme.	2

10.7 - CONTINUING AIRWORTHINESS

DEFINITIONS IMPORTANT FOR THIS SUBMODULE

Airworthy	Airworthy means the aircraft conforms to its type design and is in a condition for safe operation.
Aircraft Maintenance Program (AMP)	A document which describes or incorporates by reference the specific scheduled maintenance tasks and their frequency of completion, the associated maintenance procedures and related standard maintenance practices necessary for the safe operation of those aircraft to which it applies
Continuing Airworthiness (C-A)	All the processes ensuring that, at any time in its operating life, the aircraft complies with the airworthiness requirements in force and is in a condition for safe operation.
Part 21	Means the requirements and procedures for the certification of aircraft and related products, parts and appliances, and of design and production organizations.
Part CAMO Vs Part M/ Sub-G	Organizations that hold a valid (until 24.Sept 2021) Part M Subpart G Approval shall apply to the competent authority for an approval certificate in accordance with Annex Vc (Part-CAMO). The establishment of a Safety Management System (SMS) is mandatory within organizations Part-CAMO managing the C-A of CMPA and / or operated in CAT under license 1008/2008.
Part CAO Vs Part M/Sub-F	C-A Management and Maintenance can be carried out in a single organization CAO (Combined Airworthiness Organization), or one of these two privileges can be exercised independently for Non-complex aircraft and not operated Commercial Air Transport under 1008/2008 license. Organizations that hold a valid (until 24.Sept 2021) Part M Subpart F Approval shall apply to the competent authority for an approval certificate in accordance with Annex Vd (Part-CAO).
Part M (Annex I)	Technical requirements in terms of C-A management and maintenance for non-light aircraft and/or operating in Commercial Air Transport (CAT) under 1008/2008 license. CAMO may issue Airworthiness Review Certificate and Permit to Fly.
Part M-L (LIGHT) (Annex Vb)	The requirements of Part-ML shall apply to the following other than CMPA not listed in the air operator certificate of an air carrier under 1008/2008 license: - Aeroplanes of 2 730 kg maximum take-off mass (MTOM) or less; - Rotorcraft of 1 200 kg MTOM or less, certified for a maximum of up to 4 occupants; - Other ELA2 aircraft.

PART 21: PROVISIONS FOR CONTINUING AIRWORTHINESS

FAILURES, MALFUNCTIONS AND DEFECTS

SYSTEM FOR COLLECTION, INVESTIGATION AND ANALYSIS OF DATA

The Type Certificate Holder (TCH) shall have a system for collecting, investigating and analyzing reports of information related to failures, malfunctions, defects or other occurrences which cause or might cause adverse effects on the Certificate of Airworthiness of the product.

REPORTING TO EASA

The type certificate holder shall report to EASA any failure, malfunction, defect or other occurrence of which it is aware that is related to a product which has resulted in or may result in an unsafe condition. These reports shall be made as soon as practicable and, in any case, dispatched not more than 72-hours after the identification of the possible unsafe condition. A typical example would be an uncontained engine failure which resulted in damage to aircraft primary structure.

INVESTIGATION OF REPORTED OCCURRENCES

When an occurrence results from a deficiency in the design, or a manufacturing deficiency, the type certificate holder shall investigate the reason for the deficiency and report to the agency the results of its investigation and any action it is taking or proposes to take to correct that deficiency. If the agency finds that an action is required to correct the deficiency, the TCH shall submit the relevant data to the agency.

AIRWORTHINESS DIRECTIVES

An airworthiness directive **Form 7-1** means a document issued by the Agency which mandates actions to be performed on an aircraft to restore an acceptable level of safety and shall contain at least the following information:

a. An identification of the unsafe condition.
b. An identification of the affected aircraft.
c. The action(s) required.
d. The compliance time for the required action(s).
e. The date of entry into force.

In service experience, additional testing, further analysis, etc., may show that certain initially accepted assumptions are not correct. Thus, certain conditions initially demonstrated as safe, are revealed by experience as being unsafe. In this case, it is necessary to mandate corrective actions in order to restore a level of safety consistent with the applicable certification requirements.

SUBPART P: ISSUE A PERMIT TO FLY

See *Submodule 6* in this book. A permit to fly is required when:

a. After a maintenance or a modification, on an aircraft with a valid Certificate of Airworthiness;
b. The aircraft leaves maintenance and no longer has a valid Certificate of Airworthiness;
c. The modification introduced has not been previously approved;
d. The level of repair or modification carried out is incompatible with maintaining the validity of the Certificate of Airworthiness.

A permit to fly may be issued by the competent authority and in certain cases, respecting certain flight conditions by:

a. An appropriately approved design organization under Part 21J;
b. An appropriately approved production organization under Part 21G;
c. An appropriately approved continuing airworthiness management organization under Part CAMO.

For permits issued under points (a), (b), or (c), a copy of the permit to fly and associated flight conditions shall be submitted to the competent authority at the earliest opportunity but not later than 3 days.

PART M

PART M SUBPART A: GENERAL

The continuing airworthiness of aircraft and components for installation shall be ensured in accordance with the requirements of Annex I (Part M), except for aircraft other than the complex motor powered aircraft such as those below to which the requirements of Part ML shall apply.

a. Aeroplanes of 2 730 kg maximum takeoff mass or less;
b. Rotorcraft of 1 200 kg maximum takeoff mass or less, certified for a maximum of 4 occupants;
c. Other European light aircraft (ELA2) aircraft.

The technical requirements of Part M and Part ML establish the measures to be taken to ensure that airworthiness is maintained, including maintenance. It also specifies the conditions to be met by the persons or organizations involved in such continued airworthiness management.

SOLVENCY OF AIR CARRIERS

This regulation describes the licensing of community air carriers, the right of community air carriers to operate intra-community air services and the pricing of intra-community air services. This license is established to recognize the potential link between the financial health of an air carrier and safety in order to reduce risks to passengers.

Community air carriers failing to fulfill the requirements for maintaining a valid operating license should not be allowed to continue operations. An air carrier should also be insured to cover liability in case of accidents with respect to passengers, cargo and third parties.

WHICH PART M IS APPLICABLE?

[**Refer to Figure 7-1**]

PART M – SUBPART B: ACCOUNTABILITY

The owner of the aircraft shall be responsible for the continued airworthiness of the aircraft and shall ensure that no flight takes place unless all of the following requirements are met:

a. The aircraft is maintained in an airworthy condition.
b. Any operational and emergency equipment fitted is correctly installed and serviceable or clearly identified as unserviceable.
c. The airworthiness certificate is valid.
d. The maintenance of the aircraft is performed in accordance with the aircraft maintenance program.

The person or organization performing maintenance shall be responsible for the tasks performed. The pilot-in-command or the operator, shall be responsible for the satisfactory accomplishment of the pre-flight inspection. That inspection shall be carried out

	Commercial Operations (C-A-T)		Other Than C-A-T	Non Commercial (Private)
	With License 1008/2008	Without License		
CMPA	Part M	Part M	Part M	Part M
Non CMPA	Part M	Part M	Part M	Part M
Light Aircraft	Part M	Part M-L	Part M-L	Part M-L

Figure 7-1. This chart describes whether an aircraft may be maintained according to the rules of Part M or according to the less restrictive rules of Part M-L. Light aircraft = Part M-L.

by the pilot or another qualified person and shall not need to be carried out by an approved maintenance organization or by certifying staff. In the case of aircraft used by air carriers licensed by 1008/2008 the operator shall be responsible for the continuing airworthiness of the aircraft it operates and shall:

a. Take the necessary steps to ensure its approval as a continuing airworthiness management organization Part CAMO or Part M Sub. G, as part of air operator certificate for the aircraft it operates;
b. Take the necessary steps to ensure its approval in accordance with Annex II (Part 145) or conclude a written contract.

OCCURRENCE REPORTING

Accountable persons or organizations (approved continuing airworthiness management or maintenance organizations) should ensure that the type certificate holder receives adequate reports of occurrences for that aircraft type to enable it to issue appropriate service instructions and recommendations to all owners or operators. Liaison with the type certificate holder is recommended to establish whether published or proposed service information will resolve the problem or to obtain a new solution to a problem. In respect to maintenance, reporting a condition which endangers flight safety is normally limited to:

a. Serious cracks, permanent deformation, burning or serious corrosion of structure found during scheduled maintenance of the aircraft or component.
b. Failure of any emergency system during scheduled testing.

The person or organization shall submit the reports as soon as possible, but no later than 72-hours to the competent authority and type design holder from the moment when the person or organization identified the condition to which the report relates, unless exceptional circumstances prevent this.

PART M – SUBPART C: CONTINUING AIRWORTHINESS

The aircraft's continuing airworthiness and the serviceability of the various operational and emergency equipment shall be ensured by the following methods:

PREFLIGHT INSPECTION

Preflight inspection includes all of the actions necessary to ensure that the aircraft is fit to make the intended flight by:

a. A walk around inspection of the aircraft and its emergency equipment for condition, including in particular any obvious signs of wear, damage or leakage (external surfaces, engines, pitot/static, tyre inflation, etc.).
b. Inspection of technical log for deferred defects.
c. A control of consumable fluids, gases.
d. Insuring all doors are securely fastened.

MINIMUM EQUIPMENT AND CONFIGURATION DEVIATION LISTS: MEL/CDL

The operator should have a system to ensure that all defects affecting the safe operation of the aircraft are rectified within the limits prescribed by the approved MEL, CDL or maintenance data, as appropriate.

AIRCRAFT MAINTENANCE PROGRAM (AMP)

The owner, CAO or CAMO must have a system to ensure that all aircraft maintenance checks are performed within the limits prescribed by an approved AMP.

For complex motor powered aircraft, the CAMO managing continuing airworthiness should have a system to analyze the effectiveness of the maintenance program with regard to spare parts, established defects, malfunctions and damage, and to amend the maintenance program accordingly.

CERTIFICATE OF RELEASE TO SERVICE (CRS)

[**Refer to Figure 7-1**] Except for aircraft released to service by a maintenance organization approved in accordance with Part 145, the CRS shall be issued in accordance to Part M Subpart H specifying: No aircraft shall be released to service unless a CRS is issued when all required maintenance tasks have been properly carried out.

The CRS shall be issued by an authorized certifying staff of the maintenance organization approved in accordance with Part M Subpart or with Annex Vd (Part CAO), except for maintenance tasks other than complex maintenance tasks listed in Appendix VII to Part M where the CRS is issued, or alternatively by:

1. Independent certifying staff.
2. The pilot acting with a valid pilot license issued by a member state for the aircraft type.

EFFECTIVENESS

The CAMO managing the continuing airworthiness of a complex motor powered aircraft should have a system to analyze the effectiveness of the maintenance program, with regard to spares, established defects, malfunctions and damage, and to amend the maintenance program accordingly. The CAMO/CAO must ensure accomplishment of airworthiness directives and operational directives with a continuing airworthiness impact including operating rules such as ETOPS, long range operations, reduced vertical separation minima, minimum navigation performance specifications, all weather operations, RNAV, etc.

MODIFICATIONS AND REPAIRS

A person or organization repairing an aircraft or component should assess the damage against approved repair data and the action to be taken if the damage is beyond the limits or outside the scope of such data. This could involve any one or more of the following options:

a. Repair by replacement of damaged parts, requesting technical support from the type certificate holder or from an organization approved in accordance with Part 21.
b. Agency approval of the particular repair data.

In respect to structure, the status of the current repairs should contain the description of the repair (e.g. doubler, blend, crack, dent, etc.), its location (e.g. reference to stringers, frames, etc.) and the dimensions. In the case of blend-out repairs, the remaining material should be recorded as well.

The status of modifications and repairs may include the impact of a specific modification or repair in:

a. Embodiment instructions.
b. Mass and balance changes.
c. Maintenance and repair manual supplements.
d. Maintenance program changes and instructions for continuing airworthiness.
e. Aircraft flight manual supplements.

MASS AND BALANCE (M&B) STATEMENT

The CAMO managing the continuing airworthiness must ensure the delivery to the pilot-in-command, the mass and balance statement reflecting the current configuration of the aircraft. M&B data is required to make sure the aircraft is capable of operating within the approved envelope in accordance with its type design. The M&B report needs to reflect the actual configuration of the aircraft. When it does not, the aircraft might be operated outside the certified envelope.

MAINTENANCE CHECK FLIGHTS (MCF)

The definition and operational requirements for MCFs are specified in the air operations regulation and are carried out under the control and responsibility of the aircraft operator.

During the flight preparation, the processes for the flight and post flight activities as well as the aircraft handover, should be agreed in advance between the maintenance organization and the operator. The operator should consult as necessary with the CAMO in charge of the airworthiness of the aircraft. Some possible scenarios are:

a. MCF be performed before completion of the maintenance ordered or due to incomplete maintenance.
b. Based on its own experience and for reliability considerations or quality assurance.
c. After troubleshooting a system on the ground.
d. If an aircraft system has been found to fail, the dispatch of the aircraft is not possible.
e. For certain MCF's the data obtained or verified in flight will be necessary for assessment or consideration after the flight by the maintenance organization prior to issuing the maintenance release.

AIRCRAFT MAINTENANCE PROGRAM (AMP)

An AMP may indicate that it applies to several different aircraft registrations as long as the AMP clearly identifies the tasks and procedures that are not applicable to all of the listed registrations. [**Figure 7-2**]

The AMP and any subsequent amendments to it must be approved by the competent authority and shall demonstrate compliance with the following:

a. The instructions issued by the competent authority is normally based upon the maintenance review board report where applicable, the maintenance planning document, the relevant chapters of the maintenance manual or any other maintenance data containing information on scheduling;
b. The instructions for continuing airworthiness issued by the type certificate holder is included in the certification specifications.

For complex motor powered aircraft, when the AMP is based on maintenance steering group logic or on-condition monitoring, the AMP shall include a reliability program. The purpose of a reliability program is to ensure that the AMP tasks are effective, and their periodicity is adequate.

BASIC PRINCIPLES

The term AMP includes scheduled maintenance tasks and their associated procedures and standard maintenance practices. The AMP details should be reviewed at least annually and should contain a preface which will define the AMP contents, the inspection standards to be applied, permitted variations to task frequencies, and where applicable any procedure to manage the evolution of established check or inspection intervals. Repetitive maintenance tasks derived from modifications and repairs should also be incorporated into the approved AMP.

CONTINUING AIRWORTHINESS RECORD SYSTEM

At the completion of any maintenance, an aircraft certificate of release to service shall be entered in the aircraft continuing airworthiness record with the date and/or any applicable parameter at which the maintenance was performed, as soon as practicable and no later than 30 days after the completion of any maintenance.

For components with airworthiness limitations, this information should be found on the authorized release certificate (EASA Form 1 or equivalent).

For life limited parts, some relevant information required may need to be introduced in the in-service history records. The aircraft continuing airworthiness record system shall:

a. Contain the date of the entry, the total in-service life accumulated in the applicable parameter for aircraft, engine(s) and/or propeller(s).
b. Include the current mass and balance report and the current status of:

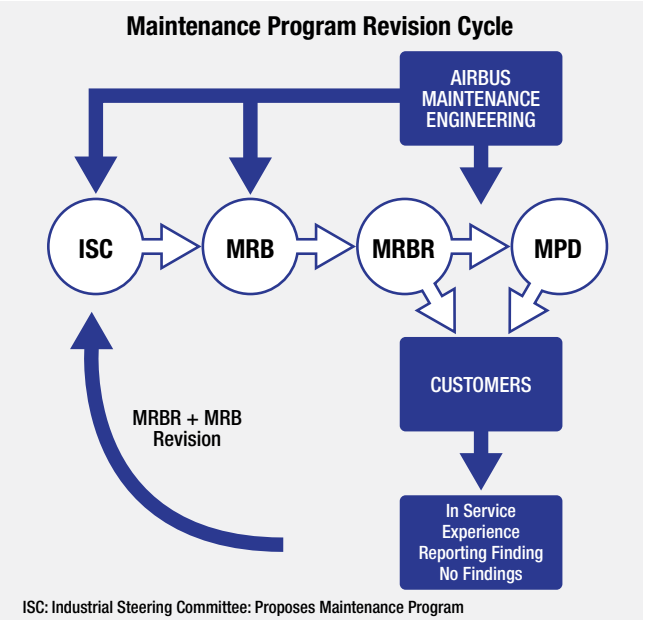


Figure 7-2. Shows the typical cycle of those involved regarding revisions of an aircraft's maintenance cycle.

- ADs and measures mandated by the competent authority in immediate reaction to a safety problem.
- Modifications and repairs.
- Compliance with the AM.
- Deferred maintenance tasks and deferred defects rectification.

The current status of compliance with the AMP means the last and next accomplishment date for the tasks specified in the maintenance schedule of the AMP. It should include:

a. An identifier specific enough to allow an easy and accurate identification of the task to be carried out, such as a task reference combined with a task title or short description of the work to be performed.
b. The engine, propeller or component identification when the task is controlled at engine, propeller, or component level.
c. The date when the task was accomplished (when the certificate of release to service was issued), and for repetitive tasks when it is next due time, as well as when the terminating action is performed.

Where the task is controlled by flight hours, and/or flight cycles, and/or landings, and/or calendar time, and/or any other applicable parameter, the total in-service life accumulated by the aircraft, engine, propeller or component (as appropriate) in the suitable parameter(s) should also be included.

The maintenance schedule for the AMP may include tasks controlled at the component level coming from a mandatory requirement in accordance with Part 21 and to be performed in a workshop, such as:

a. The removal of a component for periodic restoration to return the component to a specified standard (e.g. removal of the landing gear for overhaul).
b. The periodic removal of a component for replacement of a sub-component by a new one.
c. A periodic inspection or test to confirm that a component meets specified performance standards (e.g. functional check). The component is left in service (no further maintenance action taken) on the condition that it continues to fulfill its intended purpose within specified performance limits until the next scheduled inspection.

MAINTENANCE MODES

The various maintenance modes can be divided between the categories of Hard time. On-condition, and condition monitoring. [**Figure 7-3**]

HARD TIME

Hard time is a preventive process in which known deterioration of a component is limited to an acceptable level by the maintenance actions which are carried out at periods related to time in service (e.g. calendar time, number of cycles, number of landings). The prescribed actions restore the component utility margin to the applicable time limitation.

ON-CONDITION

On-Condition is a preventive process in which the component is inspected or tested, at specified periods, to an appropriate standard in order to determine whether it can continue in service. The purpose is to remove the component before its failure in service.

CONDITION MONITORING

Condition Monitoring is a process in which a parameter of a condition in a component (vibration, temperature, oil consumption, etc.) is monitored to identify the development of a fault. The purpose is to remove the component before its failure in service (e.g. due to related repair costs), but they are permitted to remain in service without preventive maintenance until a functional failure occurs. The owner or operator shall establish a system to keep the following documents and data:

a. The technical log or other data equivalent in scope and detail, covering the 36 months period prior to the last entry.
b. The CRS and detailed maintenance records covering the 36 month period including ADs, modifications and repairs, and other schedules maintenance.
c. EASA Form 1 and certificates of conformity.

AIRCRAFT TECHNICAL LOG SYSTEM

For Commercial Specialized Operations (CAT, commercial transport), the operator shall use a technical log system containing the following information for each aircraft: [**See Figure 5-8**]

a. Information about each flight, necessary to ensure continued flight safety.
b. The current aircraft certificate of release to service.
c. The current maintenance statement giving the aircraft maintenance status of what scheduled and out of phase maintenance is next due except that the competent authority may agree to the maintenance statement being kept elsewhere.
d. All outstanding deferred defects rectifications that affect the operation of the aircraft.
e. Any necessary guidance instructions on maintenance support arrangements.

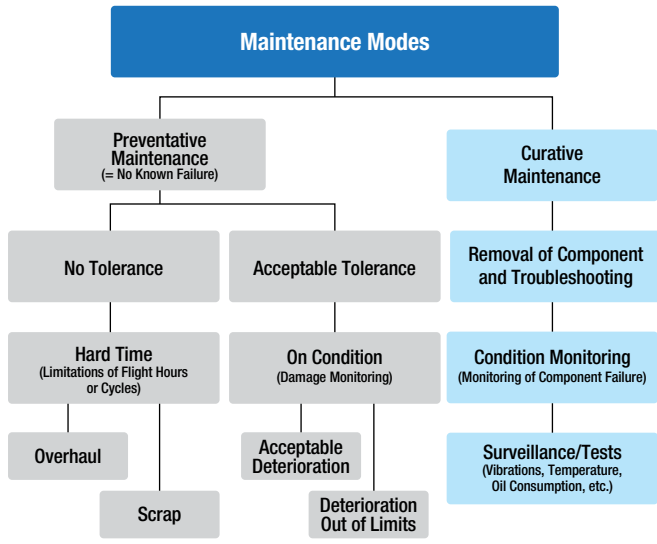


Figure 7-3. The categories and decision processes of various maintenance problems and tasks.

AIRCRAFT MAINTENANCE PROGRAMS

MAINTENANCE CHECKS AND INSPECTIONS

Aircraft maintenance checks are periodic inspections that have to be done on all commercial/civil aircraft after a certain amount of time or usage. Commercial operators of large or turbine-powered aircraft follow a continuous inspection program approved by the airworthiness authorities. Each operator must prepare a Continuous Airworthiness Maintenance Program (CAMP) under its operations specifications. The CAMP includes both routine and detailed inspections. Airlines and airworthiness authorities casually refer to the detailed inspections as "checks", commonly one of the following: A check, B check, C check, or D check. A and B checks are lighter checks, while C and D are considered heavier checks.

"A" CHECK

This is performed approximately every 500-800 flight hours or 200-400 cycles. It needs about 20-50 man hours and is usually performed overnight at an airport gate or hangar. The actual occurrence of this check varies by aircraft type, the cycle count (takeoff and landing is considered an aircraft cycle), or the number of hours flown since the last check. The occurrence can be delayed by the airline if certain predetermined conditions are met.

"B" CHECK

This is performed approximately every 4-6 months. It needs about 150 man hours and is usually performed within 1–3 days at an airport hangar. A similar occurrence schedule applies to the B check as to the A check. B checks may be incorporated into successive A checks: A-1 through A-10 complete all the B check items.

"C" CHECK

This is performed approximately every 20-24 months or a specific amount of actual flight hours as defined by the manufacturer. This maintenance check is much more extensive than a B Check, requiring a large majority of the aircraft's components to be inspected. This check puts the aircraft out of service and until it is completed, the aircraft must not leave the maintenance site. It also requires more space than A and B Checks; usually a hangar at a maintenance base. The time needed to complete such a check is generally 1-2 weeks and the effort involved can require up to 6 000 man hours. The schedule of occurrence has many factors and components as has been described, and thus varies by aircraft category and type. [**Figure 7-4**]

"D" CHECK

This is by far the most comprehensive and demanding check for an airplane. It is also known as a heavy maintenance visit. This check occurs approximately every 5 years. It is a check that, more or less, takes the entire airplane apart for inspection and overhaul. Also, if required, the paint may need to be completely removed for further inspection on the fuselage metal skin. Such a check can usually demand up to 50 000 man hours and it can generally take up to 2 months to complete, depending on the aircraft and the number of technicians involved. It also requires the most space of all maintenance checks, and as such must be performed at a suitable maintenance base. Given the elevated requirements of this check and the tremendous effort involved in it, it's also by far the most expensive maintenance check of all, with total costs for a single visit ending up well within the million Euro range.

Because of the nature and the cost of such a check, most airlines (especially those with a large fleet) have to plan D Checks for their aircraft years in advance. Often, older aircraft being phased out of a particular airline's fleet are either stored or scrapped upon reaching their next D Check, due to the high costs involved in it in comparison to the aircraft's value. On average, a commercial aircraft undergoes two to three D Checks before it is retired. [**Figure 7-5**]

AIRWORTHINESS DIRECTIVES

An airworthiness directive (AD) is a notification to owners and operators of certified aircraft that a known safety deficiency with a particular model of aircraft, engine, avionics or other system exists and must be corrected. If a certified aircraft has outstanding airworthiness directives that have not been complied with, the aircraft is not considered airworthy. Thus, it is mandatory for an aircraft operator to comply with an AD. **Form 7-2A and B** illustrates an airworthiness directive.

PURPOSE

ADs usually result from service difficulty reporting by operators or from the results of aircraft accident investigations. They are issued either by the national civil aviation authority of the country of aircraft manufacture or of aircraft registration. When ADs are issued by the country of registration they are almost always coordinated with the civil aviation authority of the country of

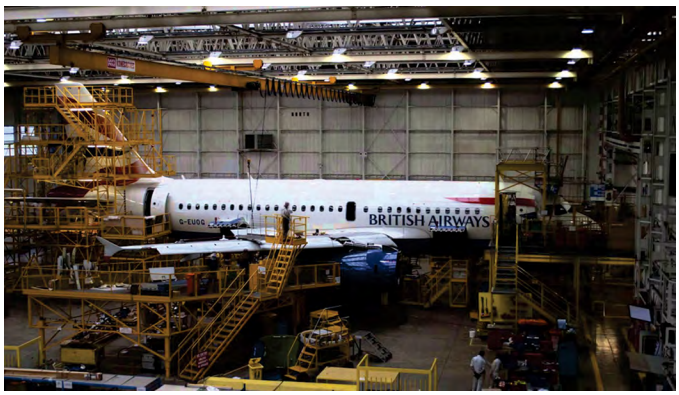


Figure 7-4. "C" Check inspection.

Figure 7-5. "D" Check inspection.

manufacture to ensure that conflicting ADs are not issued. In detail, the purpose of an AD is to notify aircraft owners:

- That the aircraft may have an unsafe condition, or
- That the aircraft may not be in conformity with its basis of certification or of other conditions that
- affect the aircraft's airworthiness, or
- That there are mandatory actions that must be carried out to ensure continued safe operation, or
- That, in some urgent cases, the aircraft must not be flown until a corrective action plan is designed and carried out.

ADs are mandatory in most jurisdictions and often contain dates or aircraft flying hours by which compliance must be completed. ADs may be divided into two categories:

1. Those of an emergency nature requiring immediate compliance prior to further flight, and
2. Those of a less urgent nature requiring compliance within a specified period of time.

ISSUANCE

Airworthiness Directive are issued by most of the civil aviation regulatory authorities including, but not limited to:

- European Aviation Safety Agency
- Directorate General of Civil Aviation (India)
- Federal Aviation Administration (USA)
- Transport Canada
- Civil Aviation Safety Authority (Australia)

SERVICE BULLETINS

With increasing inservice experience, the type certificate holder may find ways to improve the original design which results in either lower maintenance costs, or increased performance. These improvements (normally involving some alterations) are suggested through service bulletins to their customers as optional (and may be extra cost) items. The customers may exercise their discretion whether or not to incorporate the bulletins. Sometimes SBs can become mandated by relevant ADs.

SCOPE

Separate service bulletins shall be issued to cover each subject and shall describe changes that fall into the following categories:

- Modifications to the aircraft, engine or accessory including embedded software.
- Modifications, which affect performance, improve reliability, increase safety of operation, provide improved economy or facilitate maintenance or operation.
- Substitution of one part with another superseding part only when it is not completely interchangeable both functionally and physically, or when the change is considered to be sufficiently urgent or critical that special scheduling or record of accomplishment will be required.
- Substitution of one embedded software program by another which change equipment function and the part number of the programmed memory device, requiring a record of accomplishment.
- Special inspections/checks required to maintain the aircraft, engine, or accessories in safe operating condition.
- One time inspections/checks to detect a flaw or manufacturing error.
- Special inspections/checks required to be performed until a corrective action can be taken. (e.g., an inspection to detect cracks in a radius until the radius can be ground out.) The modification information may be issued as a revision to the same service bulletin that transmits the inspection instructions.
- Special functional checks of an urgent nature required to detect an incipient failure, such as pressure checks, functional checks, etc.
- Reduction of existing life limits or establishment of first time life limits for components.
- Conversions from one engine model to another.
- Changes affecting the interchangeability or intermix of parts.

A service bulletin shall be practical from the operator's standpoint, i.e., it shall not require new parts when old parts may be repaired or reworked, but it shall, wherever practicable, include instructions and lists of new parts to allow the operator to select either method. Service bulletins shall be written for applicability to in-service units or equipment.

A service bulletin once issued shall not be canceled. In case the original intent of the service bulletin becomes invalidated, a revision to the original service bulletin, or a new service bulletin, shall be issued for the purpose of restoring the units already modified to the original or preferred configuration. If a new service bulletin is issued that supersedes the original service bulletin, then a revision to the invalidated service bulletin shall also be issued in order to stop progression of its accomplishment.

Even though there are many publications and correspondence available to the airframe, engine and component manufacturers, they shall not be used to transmit actions which require a record of accomplishment. These other publications may be used to provide information such as the following:

- To discuss field problems and to highlight information already or scheduled to be incorporated in existing documentation.
- To notify operators of interchangeable or future spare part numbers of equipment which have no effect on aircraft safety, performance, maintainability and reliability.
- To provide preliminary information of a forthcoming service bulletin.
- To notify operators of available or forthcoming vendor modifications.
- To notify operators of changes in material finishes, protective coatings, etc.

Service Bulletins must not be used to cover routine recommended inspections/checks, standard repairs, or revisions to maintenance practices or shop procedures. These shall be covered as revisions to the manufacturer's Aircraft Maintenance Manual (AMM), Structural Repair Manual (SRM), or Component Maintenance Manual (CMM) as appropriate.

TYPES OF SERVICE BULLETINS (SB)

ALERT SERVICE BULLETIN

Alert service bulletins shall be issued on all matters requiring the urgent attention of the operator and shall be limited generally to items affecting safety. Matters of extreme urgency with compliance recommendations shall be transmitted by suitable media, such as telegraph, cable, and facsimile or in some cases, by telephone. These shall be identified as alert service bulletins and shall contain a service bulletin number. A complete alert service bulletin shall be prepared and distributed promptly to confirm and elaborate upon such messages.

STANDARD SERVICE BULLETIN

Standard Service Bulletins shall be issued where the use of alert service bulletins is not required.

ENGINE CONVERSION SERVICE BULLETIN

Conversion service bulletins will be issued to provide operators with information necessary to convert engine models from one designation level to another.

SERVICE BULLETIN CONTENTS

Service bulletins shall contain a title. It shall contain the chapter name keyword, and a brief statement of the work involved. This information shall be in the sequence such as "Air Conditioning - Out Flow Valve - Install New Relay in Differential Control", or for engine conversion service bulletin "Turbojet Engine SB 4716, Conversion Model 3250-15 to Model 3250-17R." The body of the service bulletin may be preceded by a summary. The summary should contain an overview of the information contained in the service bulletin.

The body of the service bulletins should be prepared in the following sections:

- Planning information
- Material information
- Accomplishment instructions and optional appendices.

PLANNING INFORMATION

This section shall contain the information required to permit the operator to determine if the service bulletin should be applied to his equipment and to plan its accomplishment. It includes the following:

- *Service Bulletin Affectivity*—specifies the equipment to which the service bulletin is applicable. An SB number shall apply to one model or type only.
- *Concurrent Requirements*—when applicable, state if other service bulletins or portions thereof, have to be accomplished in conjunction with, prior to, or subsequent to accomplishment of the subject service bulletin.
- *Reason*—under this heading, sufficient facts shall be provided to assist the operator in determining the service bulletin's applicability to, or effect on, his operation.
- *Description*—provides a brief but complete statement outlining what the service bulletin does.
- *Compliance Recommendation*—This section shall contain the manufacturer's recommendations for accomplishment of the actions specified in the service bulletin.

The service bulletin shall include one of these four compliance recommendation categories:

- Service Bulletin must be accomplished.
- Service Bulletin recommended to be accomplished to prevent significant operational disruptions.
- Service Bulletin to introduce improvements.
- Service Bulletin for convenience or option.

Form 7-3A and B illustrates excerpts from a service bulletin.

When governmental approval of a change is required, approval shall be obtained prior to release of the Service Bulletin. The planning information section should also include the following:

- *Manpower*—Provide an estimate of the man-hours required by the operators to perform the service bulletin.
- *Weight and Balance*—Weight and balance data shall be furnished.
- *Electrical Load Data*—Provide a statement as to the effect of the Service Bulletin on the aircraft electrical loads.
- *Software Accomplishment Summary*—If the service bulletin involves any change to software, include the accomplishment summary information in accordance with RTCA Document DO-178.
- Other Publications Affected - List the chapter/section locations within affected manuals and catalogs, and service bulletins which will require revision as a consequence of a service bulletin or SB revision.
- Interchangeability or Intermixability of parts - When parts are interchangeable, the service bulletin shall include a section that identifies the possibility of full substitution of premodified and post-modified components.

MATERIAL INFORMATION

Material information is also given in the body of the Service Bulletin. It typically includes the following:

- Material Price and Availability: provides a complete list of parts kits available and the list price, price duration, price break quantity, and delivery information for kits.
- Industry Support Information: items that are to be provided at no charge or at a reduced price should be identified.
- Material Necessary for Each Aircraft, Engine or Component: items for which standard or military equivalents may be used shall be identified.
- Re-identified Parts: specify any parts that can be reworked or re-identified and made interchangeable.
- Tooling Price and Availability: when special equipment, such as tools, jigs, fixtures, or test equipment are required to accomplish the modification and it is available, the estimated price and delivery schedule shall be provided, including the manufacturer's name if other than the issuer of the service bulletin.
- Accomplishment Instructions.
- A section on the service bulletin shall contain step-by-step instructions for accomplishing the work.

SERVICE LETTER (SL)

The service letter is the document used to notify the airlines of the types of information that are not included in service bulletins.

MODIFICATIONS AND REPAIRS

Damage shall be assessed and modifications and repairs carried out using data approved by the Agency or by an approved Part 21 design organization, as appropriate.

MAINTENANCE DOCUMENTATION

All maintenance work done must be documented and copies retained of all CRS's issued. Detailed maintenance record copies must be retained for two years from date of release of aircraft or component.

Originals shall go with aircraft/component. Records shall be retained in a safe environment with regard fire, flood and theft. Computer back up discs and tapes etc., shall be stored in different locations to the working disc, tapes etc., to ensure at least one good copy will survive should there be theft or flood etc.

To perform the maintenance, the operator must posses and make permanently available the aircraft manufacturer's approved maintenance data. This takes many forms such as maintenance manuals, structural repair manuals, illustrated parts manuals, wiring diagrams, service bulletins and more. Every repair requires a work report with the following steps and documentation:

- Identification of damage.
- A major repair design approval sheet which identifies the applicable regulatory requirement and references for justification and/or compliance with those requirements.
- A repair plan mapping including execution instructions and including any adjustments made during the application of the repair.
- A record of all correspondences exchanged with the manufacturer if his agreement on the design has been requested.
- Structural justifications such as static, fatigue, and damage tolerance.
- A report on the impact on related systems if applicable.
- A report on the impacts of the repair on aircraft maintenance program and operations.
- A declaration of conformity of execution.

The definition of a major modification is a change to the type design that is not included in the aircraft, the engine, or a component that could materially affect weight and balance limits, structural strength, performance, engine operation, or system operation. [**Figure 7-6**]

PART M – SUBPART D: MAINTENANCE STANDARDS

The person or organization maintaining an aircraft shall ensure that all applicable maintenance data is current and readily available for use when required:

a. The regulations on continuing maintenance of aircraft, associated Acceptable Means of Compliance (AMC) and Guidance Material (GM)
b. All applicable maintenance requirements and notices such as competent authority standards and specifications;
c. All applicable ADs;
d. The appropriate sections of the Aircraft Maintenance Program (AMP),

- AMM - Aircraft Maintenance Manual
- TSM – Troubleshooting Manual
- SRM - Structural Repair Manual
- WDM – Wiring Diagram Manual
- FIM – Fault Isolation Manual
- IPC – Illustrated Parts Catalog:

  As well as the supplementary structural inspection documents, corrosion control document, service bulletins, non-destructive inspection manual, and type certificate data sheets (TCDS) as required for the work undertaken and any other relevant and document issued by the type certificate holder. [**Figure 7-7**]

The person or organization shall establish a work card or worksheet system. Maintenance tasks should be transcribed onto the work cards or worksheets **Form 7-4** card and subdivided into clear stages to ensure a record of the accomplishment of each task. Of particular importance is the need to differentiate and specify disassembly, accomplishment of task, reassembly and testing.

Maintenance should be performed by persons authorized to issue a CRS or under the supervision of persons authorized to issue a CRS. The person authorized to issue a CRS should ensure that:

- Each person working under his/her supervision has received appropriate training or has relevant previous experience and is capable of performing the required task;
- Each person who performs specialized tasks, such as welding, is qualified in accordance to an officially recognized standard.

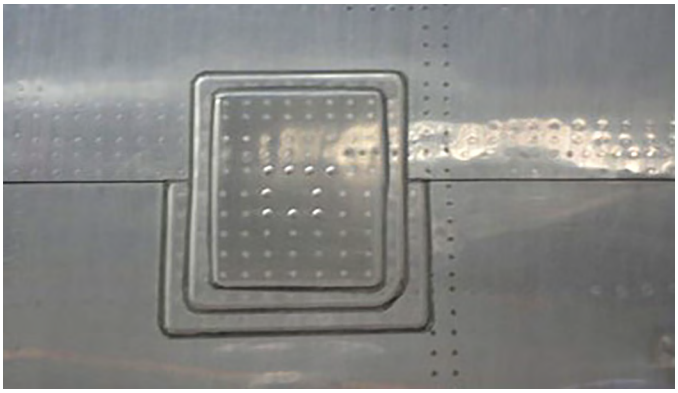


Figure 7-6. Photographic documentation of a repair is typical as a part of its work completion records.

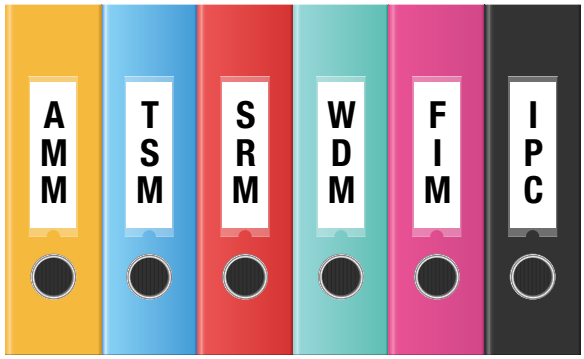


Figure 7-7. Illustrated parts catalogs documentation binders.

CRITICAL MAINTENANCE TASKS

The following maintenance tasks should primarily be reviewed to assess their impact on safety:

a. Tasks that may affect the control of the aircraft, flight path and attitude, such as installation, rigging and adjustments of flight controls;
b. Aircraft stability control systems (autopilot, fuel transfer);
c. Tasks that may affect the propulsive force of the aircraft, including installation of aircraft engines, propellers and rotors; and
d. Overhaul, calibration or rigging of engines, propellers, transmissions and gearboxes.

INDEPENDENT INSPECTION

Independent inspection is one possible error capturing method. It consists of an inspection performed by an 'independent qualified person' of a task carried out by an authorized person, taking into account that:

a. The 'authorized person' is the person who performs the task or supervises the task and assumes the full responsibility for the completion of the task in accordance with the applicable maintenance data.
b. The 'independent qualified person' is the person who performs the independent inspection and attests the satisfactory completion of the task and that no deficiencies have been found. The 'independent qualified person' does not issue a CRS, therefore he/she is not required to hold certification privileges.
c. The CRS is issued by the 'authorized person' after the independent inspection has been carried out satisfactorily.
d. The work card system should record the identification of each person, the date and the details of the independent inspection, as necessary, before the certificate of release to service is issued.

AIRCRAFT DEFECTS

Any aircraft defect that would not hazard seriously the flight safety shall be rectified as soon as practicable, after the date the aircraft defect was first identified and within any limits specified in the maintenance data or the minimum equipment list. An assessment of both the cause and any potentially hazardous effect of any defect or combination of defects that could affect flight safety should be made in order to initiate any necessary further investigation and analysis necessary to identify the root cause of the defect.

PART M – SUBPART E: COMPONENTS

All components shall be classified into the following categories:

a. Components which are in a satisfactory condition, released on an EASA Form 1 or equivalent. [**Form 7-5**]
b. Unserviceable components which shall be maintained in accordance with this regulation.
c. Components categorized as unsalvageable because they have reached their mandatory life limitation or contain a non-repairable defect.
d. Standard parts used on an aircraft, engine, propeller or other aircraft component when specified in the maintenance data and accompanied by evidence of conformity traceable to the applicable standard.
e. Material both raw and consumable used during maintenance when the organization is satisfied that the material meets the required specification and has appropriate traceability. All materials must be accompanied by documentation clearly relating to the particular material and containing a conformity to specification statement plus both the manufacturing and supplier source.

Unserviceable components should be identified and stored in a separate secure location that is managed by the maintenance organization until a decision is made on the future status of such components. In the case of unsalvageable components, the person or organization should:

a. Retain such components in the secure location.
b. Arrange for the component to be mutilated in a manner that ensures that it is cannot be restored for use, before disposing it.
c. Mark the component indicating that it is unsalvageable, when, in agreement with the component owner, the component is disposed of for legitimate non flight uses (such as training and education aids, research and development).

PART M – SUBPART F: MAINTENANCE ORGANIZATION

This subpart establishes the requirements by an organization to qualify for the issue or continuation of an approval for the maintenance of aircraft other than complex motor powered aircraft and components to be installed in, and not used by licensed air carriers in accordance with Regulation EC 1008/2008.

PART M – SUBPART G: CONTINUING AIRWORTHINESS MANAGEMENT ORGANIZATION

This subpart establishes the requirements by an organization to qualify for the issue or continuation of an approval for the management of aircraft continuing airworthiness. All approvals issued in accordance with Subpart F and Subpart G of Part M shall be valid until 24 September 2021.

PART M – SUBPART H: AIRCRAFT CERTIFICATE OF RELEASE TO SERVICE (CRS)

Except for aircraft that are released to service by a maintenance organization approved in accordance with Part 145, the CRS shall be issued in accordance with this Subpart. The CRS shall be issued by an authorized certifying staff of the maintenance organization approved in accordance with Subpart F of this Annex or with Annex Vd (Part CAO), except for maintenance tasks other than complex maintenance tasks listed in Part M where the CRS is issued, alternatively by:

a. Independent certifying staff;
b. The pilot owner.

Some examples of complex tasks are:

a. The modification, repair or replacement by riveting, bonding, laminating, or welding of a box beam, wing stringer or wing chord member or a spar flange.
b. The modification or repair of aircraft skin
c. The dismantling and subsequent reassembling of a

piston engine or reduction gears, or the welding and brazing of joints.
d. The balancing of a propeller.
e. Any additional task that requires specialized tooling, equipment or facilities or the extensive duration of the tasks or involvement of several persons.

PILOT/OWNER

To qualify as a pilot/owner, the person must. hold a valid pilot license (or equivalent) issued or validated by a member state for the aircraft type or class rating; and be the owner of the aircraft either as sole or joint owner.

PART M – SUBPART I: AIRWORTHINESS REVIEW CERTIFICATE (ARC)

In order to ensure the validity of the ARC **Form 7-6**, Part M requires periodically performing an airworthiness review of the aircraft and its continuing airworthiness records, which results in the issuance of an ARC valid for one year.

Airworthiness review staff (ARS) are responsible for performing both the documental and the physical survey. A compliance report must be produced by the ARS detailing all items checked and the outcome of the review.

- The issuance of the ARC by the ARS only certifies that the aircraft is considered airworthy in relation to the scope of the airworthiness review performed and the fact that the ARS is not aware of instances of non-compliance which endanger flight safety. Furthermore, it only certifies that the aircraft is considered airworthy at the time of the review. It is the responsibility of the owner, CAMO, or CAO to ensure that the aircraft is fully airworthy at any time.

Examples of a documented review include:

- Registration papers;
- Aircraft technical log system;
- Deferred defects;
- MEL & CDL if applicable;
- Aircraft flight manual including aircraft configuration;
- Aircraft maintenance program;
- Maintenance data;
- Relevant work packages;
- AD status;
- Modification and service bulletin status;
- Modification and repair approval sheets;
- Status of life limited parts and time controlled components;
- Relevant EASA Form 1 or equivalent;
- Mass and balance report and equipment list;
- Aircraft, engine and propeller type certificate data sheets.

PHYSICAL SURVEY

A physical survey could require actions categorized as maintenance (e.g. operational tests, tests of emergency equipment, visual inspections requiring panel opening, etc.). In this case, after the airworthiness review, a release to service should be issued.

PART CAMO (ANNEX VC): CONTINUING AIRWORTHINESS MANAGEMENT ORGANIZATION

Part CAMO establishes the requirements of an organization to qualify for the issue or continuation of a certificate for the management of continuing airworthiness of an aircraft and of components for installation. [**Form 7-7, A-B**]

Approved organizations that are in accordance with this annex may do the following:

a. Manage the continuing airworthiness of aircraft, except those used by air carriers licensed in accordance License No 1008/2008, as listed on the certificate.
b. Manage the continuing airworthiness of aircraft used by air carriers licensed in accordance with License No 1008/2008, when listed both on its certificate and on its air operator certificate.
c. Arrange to carry out limited continuing airworthiness tasks.
d. Issue and extend an airworthiness review certificate (ARC) under the conditions of Annex I – Part M or Annex Vb (Part ML), as applicable.
e. Issue a recommendation for the airworthiness review to the competent authority of the member state of registry under the conditions of Annex I (Part M).

MANDATORY OCCURRENCE REPORTING

All incidents and occurrences that meet the reporting criteria defined in Part M and Part 145 should be reported as required by their respective requirements.

Defect management requires a system whereby information on faults, malfunctions, defects and other occurrences that cause or might cause adverse effects on the continuing airworthiness of the aircraft is captured. The organization should assign responsibility to one or more qualified persons with clearly defined authority for coordinating action on airworthiness occurrences and for initiating any necessary further investigation and follow up activity.

MANAGEMENT SYSTEM

The organization shall establish, implement, and maintain a management system that includes the core part of the management system framework that focuses on what is essential for safety management by mandating the organization to:

a. Clearly define accountabilities and responsibilities.
b. Establish a safety policy and the related safety objectives.
c. Implement safety reporting procedures inline with just culture principles defined.
d. Ensure the identification of aviation safety hazards entailed by its activities, ensure their evaluation, and the management of associated risks:
   - Taking actions to mitigate the risks.
   - Verifying the effectiveness of the actions taken to mitigate the risks.
   - Monitor compliance, while considering any additional requirements that are applicable to the organization.
   - Keep their personnel trained, competent, and informed about significant safety issues.
   - Document all the key management system processes.

e. The following are key safety management processes:
   - Hazard identification.
   - Safety risk management.
   - Internal investigation: The organization should define how to investigate incidents such as errors or near misses, in order to understand not only what happened, but also how it happened, to prevent or reduce the probability and/or consequence of future recurrences.
   - Safety performance monitoring and measurement.
   - Management changes and continuous improvement.
   - Immediate safety action and coordination with the aircraft operator's emergency response plan.

As aviation is a complex system with many organizations and individuals interacting together, the primary focus of the key safety management processes is on the organizational processes and procedures, but it also relies on the humans in the system. The organization and the way in which it operates can have a significant impact on human performance. Therefore, safety management addresses how humans contribute both positively and negatively to an organization's safety outcomes, recognizing that human behavior is influenced by the organizational environment.

The effectiveness of safety management largely depends on the degree of commitment of the senior management to create a working environment that optimizes human performance and encourages personnel to actively engage in and contribute to the organization's management processes. Similarly, a positive safety culture relies on a high degree of trust and respect between the personnel and the management, and it must therefore be created and supported at the senior management level.

CAMO REQUIREMENTS IN ADDITION TO THE MANAGEMENT SYSTEM

CONTRACTING AND SUBCONTRACTING

When the organization subcontracts any part of its management activities to another organization, the subcontracted organization shall work under the approval of the organization.

FACILITIES

The organization shall provide suitable office accommodations at appropriate locations for personnel.

CONTINUING AIRWORTHINESS MANAGEMENT RECORDS

The record keeping system should ensure that all records are accessible within a reasonable time whenever they are needed. These records should be organized in a manner that ensures their traceability and retrievability throughout the required retention period. Records should be kept in paper form, or in electronic format, or a combination of the two.

PERSONNEL REQUIREMENTS

The organization shall appoint an accountable manager, who has corporate authority for ensuring that all continuing airworthiness management activities can be both financed and carried out in accordance with the regulations.

For personnel involved in the delivery of the basic continuing airworthiness management services of the organization should include at least the following staff members:

a. Nominated persons as continuing airworthiness manager.
b. Safety Manager, compliance monitoring manger related processes and tasks, including application of human factor principles, internal investigations, and safety training.
c. Airworthiness review staff.
d. Technical support personnel such as, planners, engineers, and technical record staff.
e. Personnel involved in developing and amending/reviewing the AMP, in assessing its effectiveness and/or working on reliability program.
f. Contract staff in the above categories.

CONTINUING AIRWORTHINESS MANAGEMENT

The organization shall ensure that all continuing airworthiness management is carried out in accordance with Subpart C of Part M or Part ML, as applicable.

This requirement means that the CAMO is responsible for determining what maintenance is required, when it has to be performed, by whom and to what standard in order to ensure the continued airworthiness of the aircraft.

The contract between CAMO and maintenance organization(s) should specify in detail the responsibilities and the work to be performed by each party.

AIRWORTHINESS REVIEW

Organization must comply in accordance with Part M or Part ML as applicable.

PART ML (ANNEX VB)

CONTINUING AIRWORTHINESS MANAGEMENT

The requirements of (Part ML) shall apply to the following other than complex motor-powered aircraft (light aircraft) not listed in the air operator certificate of an air carrier under 1008/2008 license. Annex (Part ML) applies to the following other than complex motor powered aircraft not listed in the air operator certificate of an air carrier licensed in accordance with Regulation EC 1008/2008:

- Aeroplanes of 2 730 kg maximum take off mass (MTOM) or less;
- Rotorcraft of 1 200 kg MTOM or less, certified for a maximum of up to 4 occupants;
- Other ELA2 aircraft

For purposes of this Annex, the following definitions shall apply:

- *Independent Certifying Staff*—Certifying staff who does not work on behalf of an approved maintenance organization and who complies with either:
  - The requirements of Part-66;
  - For aircraft to which Part-66 does not apply, the certifying staff requirements of the member state of registry of the aircraft.
- *Maintenance Organization*—An organization holding an approval issued in accordance with either:

- Subpart F of Annex I (Part-M)
- Part-145
- Part-CAO

- *Owner*—The person responsible for the continuing airworthiness of the aircraft, including either the registered owner, the lessee, or the operator.

OCCURRENCE REPORTING

Accountable persons or organizations should ensure that the design approval holder receives adequate reports of occurrences for that aircraft or component, to enable the holder to issue appropriate service instructions and recommendations to all owners or operators.

The person or organization shall submit the reports as soon as possible, but no later than 72-hours to the competent authority and type design holder from the moment when the person or organization identified the condition to which the report relates, unless exceptional circumstances prevent this.

PART ML - CONTINUING AIRWORTHINESS

The aircraft's continuing airworthiness and the serviceability of operational and emergency equipment shall be ensured by:

g. The accomplishment of preflight inspections;
h. The rectification of any defect and damage affecting safe operation;
i. The accomplishment of all maintenance in accordance with the AMP;
j. The accomplishment of any applicable:
   - AD
   - Operational directive
   - Continuing airworthiness requirement established by the Agency
   - Measure required by the competent authority as an immediate reaction to a safety problem
k. The accomplishment of modifications and repairs;
l. Maintenance check flights.

PART ML - AIRCRAFT MAINTENANCE PROGRAM (AMP)

The AMP shall clearly identify the owner and the aircraft to which it relates, including any installed engine and propeller. In addition it shall include:

- The tasks or inspections contained in the applicable minimum inspection program.
- The instructions for continuing airworthiness issued by the design approval holder.

Example

A minimum inspection program for aeroplanes of 2 730 kg MTOM and below would be performed at every annual or 100-hour interval, with a tolerance of 1 month or 10 hours. The next interval shall be calculated from the time the previous inspection takes place.

- Note 1: Use the manufacturer's maintenance manual to accomplish each task/inspection.
- Note 2: Proper operation of backup or secondary systems and components should be performed wherever a check for improper installation/operation is carried out.
- Note 3: Any applicable AD must be carried out within the requirements of that AD unless otherwise specified by the Agency.

Modifications and repairs shall be carried out using data:

- Approved by the Agency.
- Approved by a design organization complying with Part 21.
- Contained in the requirements referred to as Standard Changes and Standard Repairs of Part 21.

AIRCRAFT CONTINUING AIRWORTHINESS RECORD SYSTEM

The aircraft continuing airworthiness records shall consist of an aircraft logbook, engine logbook(s) or engine module log cards, propeller logbook(s) and log cards, for any service life limited component, as appropriate. The aircraft type and registration mark, the date together with the total flight time and flight cycles and landings, shall be entered in the aircraft logbooks.

PART ML – SUBPART D: MAINTENANCE STANDARDS

Applicable Maintenance means any applicable standard or national requirements, AD, ICA's required for any organization performing maintenance. For maintenance not performed by Part CAO or Part 145, the person performing maintenance shall:

- Be qualified for the tasks performed;
- Ensure that the area in which maintenance is carried out is well organized;
- Use the methods, techniques, standards and instructions specified in the maintenance data;
- Use the Calibrated tools and equipment;
- Ensure that maintenance is performed within any environmental limitations;
- Ensure that proper facilities are used in case of inclement weather or lengthy maintenance;
- Ensure that the risk of multiple errors during maintenance and the risk of errors being repeated in identical maintenance tasks are minimized;
- Ensure that an error capturing method (independent inspection) is implemented after the performance of any critical maintenance task;
- Perform a general verification after completion of maintenance (Checklists);
- Ensure that all maintenance performed is properly recorded and documented.

PART ML – SUBPART E: COMPONENTS

The components may be fitted only if all of these following conditions are met:

- It is in a satisfactory condition;
- It has been appropriately released to service using an EASA Form 1;
- It has been marked.

Prior to the installation of a component on an aircraft, the person or approved maintenance organization shall ensure that the particular component is eligible to be fitted if different modifications or AD configurations are applicable. Standard parts shall only be fitted when accompanied by evidence of conformity to the applicable standard and has appropriate traceability.

Raw or consumable material shall only be used if allowed for the use in relevant maintenance data:

- Such material meets the required material specification and has appropriate traceability;
- Such material is accompanied by documentation clearly relating to the particular material and containing a conformity-to-specification statement as well as the manufacturing and supplier source.

SERVICE LIFE LIMITED COMPONENTS

The term "service life-limited components" contains the following:

- Components subject to a certified life limit after which the components should be retired.
- Components subject to a service life limit after which the components shall undergo maintenance to restore their serviceability.

The approved service life is expressed in calendar time, flight hours, landings or cycles, as appropriate.

Unserviceable Component shall be identified and stored in a secure location under the control of an approved maintenance organization or independent certifying staff until a decision is made on the future status of such components.

PART ML – SUBPART H: CERTIFICATE OF RELEASE TO SERVICE (CRS)

The CRS shall be issued, either by:

- Appropriate certifying staff on behalf of the approved maintenance organization.
- Independent certifying staff.
- The pilot-owner in compliance with Part ML.

A CRS shall contain at least:

a. Basic details of the maintenance carried out;
b. The date on which the maintenance was completed;
c. The identity of the organization or person issuing the release to service, including, alternatively:
   - The approval reference of the maintenance organization and certifying staff issuing the CRS;
   - In the case of independent certification specifications the identity and, if applicable, the license number of the independent certifying staff issuing the CRS;
d. The limitations to airworthiness or operations.

LIMITED TASKS OF THE PILOT OWNER

Refer to **Form 7-8** for examples.

PART CAO COMBINED AIRWORTHINESS ORGANIZATION

This Annex establishes the requirements to be met by a CAO in order to be issued, upon application, an approval for the maintenance and continuing airworthiness management of aircraft and components for installation thereon, and to continue carrying out those activities, where such aircraft are not classified as complex motor powered aircraft and are not listed in the air operator certificate of an air carrier licensed in accordance with Regulation EC 1008/2008.

EASA AD No.

EASA	EMERGENCY AIRWORTHINESS DIRECTIVE
	AD No.: Date: 26 May 2011 Note: This Emergency Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) No 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.

This AD is issued in accordance with EC 1702/2003, Part 21A.3B. In accordance with EC 2042/2003 Annex I, Part M.A.301, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an AD applies, except in accordance with the requirements of that AD unless otherwise specified by the Agency [EC 2042/2003 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [EC 216/2008, Article 14(4) exemption].

Type Approval Holder's Name :	Type/Model designation(s) :

TCDS Number :	EASA.A
Foreign AD :	None
Supersedure :	None
ATA 27	Flight Controls – Horizontal Stabilizer Pitch Trim Runaway – Suspension of Flight Operations
Manufacturer:	
Applicability:	aeroplanes, all serial numbers.
Reason:	experienced an uncontrolled pitch trim runaway during descent. The crew succeeded in recovering a stable situation and performed an uneventful landing. Analysis of the Digital Flight Data Recorder (DFDR) and Fault History Database (FHDB) confirmed the event, but did not allow explaining the origin of the pitch trim runaway. This condition, if occurring again, could lead to loss of control of the aeroplane. To address this potential unsafe condition, Dassault Aviation has proposed to EASA to prohibit, from the effective date of this AD, any flight operations of eroplanes, to which EASA agrees by issuing this AD. This AD is considered to be an interim measure pending the outcome of the investigation currently carried out by the manufacturer. Further AD action is expected to follow when additional information is available.
Effective Date:	27 May 2011
Required Action(s) and Compliance Time(s):	From the effective date of this AD, all flights are prohibited.

Form 7-1. An example of an Airworthiness Directive.

EASA AD No.: 2014-0266-E

EASA	EMERGENCY AIRWORTHINESS DIRECTIVE
	AD No.: 2014-0266-E **Date: 09 December 2014** Note: This Emergency Airworthiness Directive (AD) is issued by EASA, acting in accordance with Regulation (EC) No 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation.

This AD is issued in accordance with EU 748/2012, Part 21.A.3B. In accordance with EC 2042/2003 Annex I, Part M.A.301, the continuing airworthiness of an aircraft shall be ensured by accomplishing any applicable ADs. Consequently, no person may operate an aircraft to which an AD applies, except in accordance with the requirements of that AD, unless otherwise specified by the Agency [EC 2042/2003 Annex I, Part M.A.303] or agreed with the Authority of the State of Registry [EC 216/2008, Article 14(4) exemption].

Design Approval Holder's Name:	**Type/Model designation(s):**
AIRBUS	A318, A319, A320 and A321 aeroplanes

TCDS Number:	EASA.A.064
Foreign AD:	Not applicable
Supersedure:	None

ATA	**Airplane Flight Manual – Undue Activation of Alpha Protection – Emergency Procedure**
Manufacturer(s):	Airbus (formerly Airbus Industrie)
Applicability:	Airbus A318-111, A318-112, A318-121, A318-122, A319-111, A319-112, A319-113, A319-114, A319-115, A319-131, A319-132, A319-133, A320-211, A320-212, A320-214, A320-215, A320-216, A320-231, A320-232, A320-233, A321-111, A321-112, A321-131, A321-211, A321-212, A321-213, A321-231 and A321-232 aeroplanes, all manufacturer serial numbers
Reason:	An occurrence was reported where an Airbus A321 aeroplane encountered a blockage of two Angle Of Attack (AOA) probes during climb, leading to activation of the Alpha Protection (Alpha Prot) while the Mach number increased. The flight crew managed to regain full control and the flight landed uneventfully. When Alpha Prot is activated due to blocked AOA probes, the flight control laws order a continuous nose down pitch rate that, in a worst case scenario, cannot be stopped with backward sidestick inputs, even in the full backward position. If the Mach number increases during a nose down order, the AOA value of the Alpha Prot will continue to decrease. As a result, the flight control laws will continue to order a nose down pitch rate, even if the speed is above minimum selectable speed, known as VLS. This condition, if not corrected, could result in loss of control of the aeroplane. To address this unsafe condition, Airbus have developed a specific Aircraft Flight Manual (AFM) procedure, which has been published in AFM Temporary Revision (TR) N° 502. For the reasons described above, this AD requires amendment of the applicable AFM.

Form 7-2A. EASA airworthiness directive (AD) example (page 1).

	This is considered to be an interim action and further AD action may follow.
Effective Date:	11 December 2014
Required Action(s) and Compliance Time(s):	Required as indicated, unless accomplished previously: (1) Before next flight after the effective date of this AD, amend the applicable AFM by inserting a copy of Airbus AFM A320 TR 502 "Abnormal V alpha Prot", issue 1. Alternatively, amending the applicable AFM can be accomplished by inserting of a copy of Appendix 1 of this AD into the Section Emergency Procedures. (2) Concurrent with the AFM amendment as required by paragraph (1) of this AD, inform all flight crews and, thereafter, operate the aeroplane accordingly.
Ref. Publications:	Airbus AFM A320 TR 502 issue 1, EASA approved 05 December 2014. The use of later approved revisions of this document is acceptable for compliance with the requirements of this AD.
Remarks:	1. If requested and appropriately substantiated, EASA can approve Alternative Methods of Compliance for this AD. 2. The results of the safety assessment have indicated the need for immediate publication and notification, without the full public consultation process. 3. Enquiries regarding this AD should be referred to the Safety Information Section, Certification Directorate, EASA. E-mail: ADs@easa.europa.eu. 4. For any question concerning the technical content of the requirements in this AD, please contact: AIRBUS – Airworthiness Office – EIAS; Fax +33 5 61 93 44 51; E-mail: account.airworth-eas@airbus.com.

Form 7-2B. EASA airworthiness directive (AD) example (page 2).

PRATT & WHITNEY CANADA

ALERT SERVICE BULLETIN

P&WC S.B. No. A60059

BULLETIN INDEX LOCATOR
73-10-01

TURBOFAN ENGINE
FMU-TO-MANIFOLD SECONDARY FUEL TUBE - REPLACEMENT OF

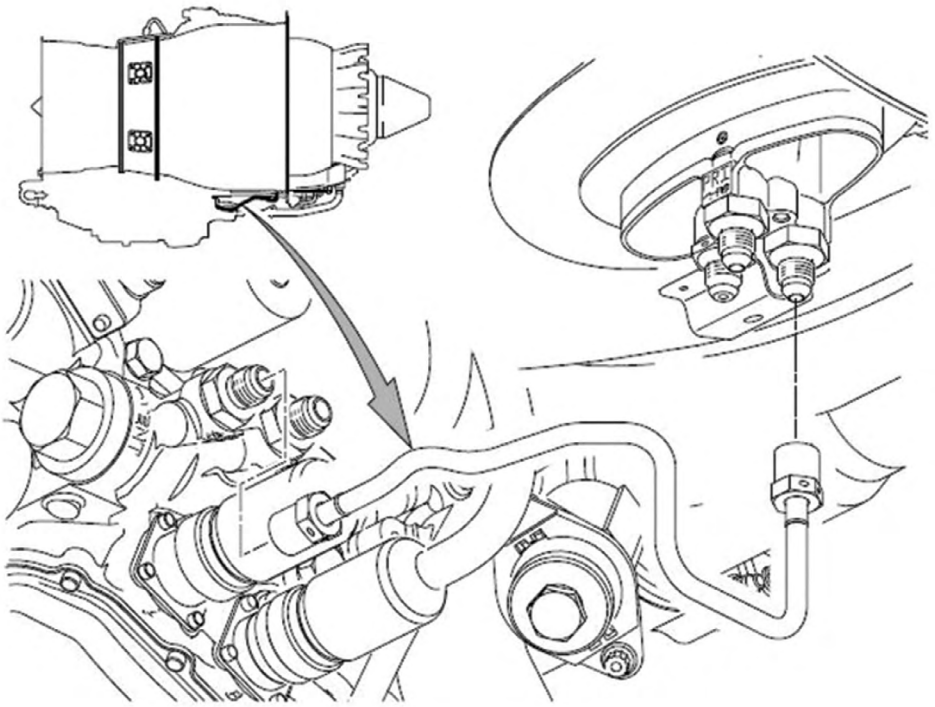
MODEL APPLICATION

PW610F-A

Commercial Support Program No: 1004410

Compliance: CATEGORY 3

Summary: The FMU-to-manifold secondary fuel tube may crack and leak. This service bulletin is introduced to replace the FMU-to-manifold secondary fuel tube on engines which have accumulated less than 200 hours on the tube.



Apr 03/2009

PW600-72-A60059
Cover Sheet

24-Hour Global Service
CFIRST CENTRE
Toll free where available (SIL GEN-027)

USA & CANADA..... 1-800-268-8000
International..... (IAC*)+8000-268-8000
* International Access Code

Other..... 1-450-647-8000
Fax..... 1-450-647-2888
Web Site..... www.pwc.ca

Form 7-3A. Typical service bulletin (page 1).

EUROCOPTER
AN EADS COMPANY

No. 2645-S-30

SAFETY INFORMATION NOTICE

SUBJECT: ICE AND RAIN PROTECTION

Recommendations in case of snow/ice accumulation in and around the engine air intakes

For the attention of	
	

AIRCRAFT CONCERNED	Version(s)	
	Civil	Military
AS350	B, BA, BB, B1, B2, B3, D	L1
AS550		A2, C2, C3, U2
EC130	B4, T2	

EUROCOPTER has participated in investigations concerning an accident which occurred following sudden engine flame-out in flight.
The investigations revealed that the engine flame-out occurred shortly after take-off and was due to a snow and ice accumulation in the engine air intake plenum, and the snow/ice mixture suddenly being ingested by the engine. The aircraft had been shutdown after a previous flight and the inlet covers had not been used. Several centimeters of snow accumulated on the upper surface of the sand filter prior to engine start. The snow was not removed from the upper surface of the particle separator and the engine air intake was not inspected prior to engine start.

A turbine engine has a good rainwater or falling-snow absorption capacity in continuous operation. However, the engine is sensitive to the absorption of an instantaneous volume of water, snow or ice, because this quantity (even if it is limited) can exceed the instantaneous absorption capacity of an operating engine.

When operated in accordance with the Flight Manual, the engine air intakes are designed to prevent - in flight or on the ground with the engine running (rotor spinning or not) - an accumulation which could lead to this type of engine flame-out.

When an area close to the engine air intake or the air intake itself is not cleaned on the ground, an instantaneous volume of water, snow or ice may detach. The design of the engine air intakes (including those equipped with a sand filter) does not ensure correct engine operation in these conditions.

EUROCOPTER would like to remind you that the check of the engine air intakes is required in all Ecureuil Flight Manuals. In order to underline the importance of this check, EUROCOPTER will progressively introduce the modifications below in all the Ecureuil Flight Manuals.

The following condition will be added to the forbidden conditions in section 2 "Limitations": "*Engine starting when snow or ice accumulations are in or around the engine air intake*".

Form 7-3B. Typical service bulletin (page 2).

Task Card / Worksheet

	AIRCRAFT TYPE:
	Reg.:
	S/N:
Customer:	Work Order or Execution Order:
Task Type: ATA:	
DESCRIPTION	Original (Parent Task):
	Req. by:
	Specify Troubleshooting: ☐ Yes
	A/C Supervised by:

MAINTENANCE TASKS	Data /(AMM / SRM / TSM) Reference procedure used	Performed by (Name and Sign.)	Date (dd mm yy)
REMOVAL			
ACCOMPLISHMENT OF TASK			
REINSTALLATION			
INDICATE IF VISUAL / FUNCTIONAL / OPERATIONAL / LEAK CHECK (Results – Condition Monitoring) INDICATE IF RESULT IS SATISFACTORY OR NOT			
CRITICAL TASKS / INDEPENDENT INSPECTION			

PARTS INSTALLATION / REMOVAL

Qty	Description	MTBO	P/N	S/N On	S/N Off

Maintenance Approval	Released by:	Date (dd/mmm/yy):
	Stamp / Sign.:	

Form 7-4. A typical work card used to organize the tasks of a repair or inspection.

<table>
<tr><td colspan="2">1. Approving Competent Authority / Country</td><td colspan="3">2. AUTHORISED RELEASE CERTIFICATE
EASA FORM 1</td><td>3. Form Tracking Number</td></tr>
<tr><td colspan="5">4. Organisation Name and Address:</td><td>5. Work Order/Contract/Invoice</td></tr>
<tr><td>6. Item</td><td>7. Description</td><td>8. Part No.</td><td>9. Qty.</td><td>10. Serial No.</td><td>11. Status/Work</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6">12. Remarks</td></tr>
<tr><td colspan="3">13a. Certifies that the items identified above were manufactured in conformity to:
□ approved design data and are in a condition for safe operation
□ non-approved design data specified in block 12</td><td colspan="3">14a □ Part-145.A.50 Release to Service □ Other regulation specified in block 12
Certifies that unless otherwise specified in block 12, the work identified in block 11 and described in block 12, was accomplished in accordance with Part-145 and in respect to that work the items are considered ready for release to service.</td></tr>
<tr><td>13b. Authorised Signature</td><td>13c. Approval/Authorisation Number</td><td></td><td>14b. Authorised Signature</td><td colspan="2">14c. Certificate/Approval Ref. No.</td></tr>
<tr><td>13d. Name</td><td>13e. Date (dd mmm yyyy)</td><td></td><td>14d. Name</td><td colspan="2">14e. Date (dd mmm yyyy)</td></tr>
<tr><td colspan="6">USER/INSTALLER RESPONSIBILITIES
This certificate does not automatically constitute authority to install the item(s).
Where the user/installer performs work in accordance with regulations of an airworthiness authority different than the airworthiness authority specified in block 1, it is essential that the user/installer ensures that his/her airworthiness authority accepts items from the airworthiness authority specified in block 1.
Statements in blocks 13a and 14a do not constitute installation certification. In all cases aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.</td></tr>
</table>

EASA Form 1 — MF/CAO/145 Issue 3'

Form 7-5. Authorized Release Certificate.

[MEMBER STATE]
A Member of the European Union (*)

AIRWORTHINESS REVIEW CERTIFICATE (ARC)

ARC reference: …….

Pursuant to Regulation (EU) 2018/1139 of the European Parliament and of the Council the [COMPETENT AUTHORITY OF THE MEMBER STATE] hereby certifies that the following aircraft:

Aircraft manufacturer: ……
Manufacturer's designation: ……
Aircraft registration: ……
Aircraft serial number: ……
is considered airworthy at the time of the review.

Date of issue: ..... Date of expiry: ……
Airframe Flight Hours (FH) at date of issue (**): ……
Signed: ..... Authorisation No: ……

1st extension: The aircraft has remained in a controlled environment in accordance with point M.A.901 of Annex I (Part-M) to Commission Regulation (EU) No 1321/2014 for the last year. The aircraft is considered to be airworthy at the time of the issue.
Date of issue: ..... Date of expiry: ……
Airframe Flight Hours (FH) at date of issue (**): ……
Signed: ..... Authorisation No: ……
Company Name: ..... Approval reference: ……

2nd extension: The aircraft has remained in a controlled environment in accordance with point M.A.901 of Annex I (Part-M) to Commission Regulation (EU) No 1321/2014 for the last year. The aircraft is considered to be airworthy at the time of the issue.
Date of issue: ..... Date of expiry: ……
Airframe Flight Hours (FH) at date of issue (**): ……
Signed: ..... Authorisation No: ……
Company Name: ..... Approval reference: ……

EASA Form 15a Issue 5

(*) Delete for non-EU Member States.

(**) Except for balloons and airships.

Form 7-6. Example of Airworthiness Review Certificate "ARC" issue by authority (EASA Form 15a).

[MEMBER STATE (*)]
A Member of the European Union (**)

CONTINUING AIRWORTHINESS MANAGEMENT ORGANISATION CERTIFICATE

Reference: [MEMBER STATE CODE (*)].MG.XXXX (ref. AOC XX.XXXX)

Pursuant to Regulation (EU) 2018/1139 of the European Parliament and of the Council and to Commission Regulation (EU) No 1321/2014 for the time being in force and subject to the condition specified below, the [COMPETENT AUTHORITY OF THE MEMBER STATE (*)] hereby certifies:

[COMPANY NAME AND ADDRESS]

as a continuing airworthiness management organisation in compliance with Section A, Subpart G of Annex I (Part-M) of Regulation (EU) No 1321/2014, approved to manage the continuing airworthiness of the aircraft listed in the attached terms of approval and, when stipulated, to issue recommendations and airworthiness review certificates after an airworthiness review as specified in point M.A.901 of Annex I (Part-M) or ML.A.901 of Annex Vb (Part-ML), and, when stipulated, to issue permits to fly as specified in point M.A.711(c) of Annex I (Part-M) to that Regulation.

CONDITIONS

1. This certificate is limited to that specified in the scope of work section of the approved continuing airworthiness management exposition as referred to in Section A, Subpart G of Annex I (Part-M) to Regulation (EU) No 1321/2014.
2. This certificate requires compliance with the procedures specified in the continuing airworthiness management exposition approved in accordance with Subpart G of Annex I (Part-M) to Regulation (EU) No 1321/2014.
3. This certificate is valid whilst the approved continuing airworthiness management organisation remains in compliance with Annex I (Part-M) and, if applicable, Annex Vb (Part-ML) to Regulation (EU) No 1321/2014.
4. Where the continuing airworthiness management organisation contracts under its Quality System the service of an organisation or several organisations, this certificate remains valid subject to such organisation(s) fulfilling applicable contractual obligations.
5. Subject to compliance with the conditions 1 to 4 above, this certificate shall remain valid until 24 September 2021, unless the certificate has previously been surrendered, superseded, suspended or revoked.

   If this form is also used for licenced air carriers in accordance with Regulation (EC) No 1008/2008, the Air Operator Certificate (AOC) number shall be added to the reference, in addition to the standard number, and the condition 5 shall be replaced by the following extra conditions 6, 7 and 8:
6. This certificate does not constitute an authorisation to operate the types of aircraft referred in condition 1. The authorisation to operate the aircraft is the AOC.
7. Termination, suspension or revocation of the AOC automatically invalidates this certificate in relation to the aircraft registrations specified in the AOC, unless otherwise explicitly stated by the competent authority.
8. Subject to compliance with conditions 1 to 4, 6 and 7, this certificate shall remain valid until 24 September 2021, unless the certificate has previously been surrendered, superseded, suspended or revoked.

Date of original issue: ……
Signed: ……
Date of this revision: …… Revision No: ……
For the Competent Authority: [COMPETENT AUTHORITY OF THE MEMBER STATE (*)]

Page 1 of 2

EASA Form 14-MG Issue 5

Form 7-7A. EASA Form 14 Page 1 - CAMO approval certificate.

Page 2 of 2

CONTINUING AIRWORTHINESS MANAGEMENT ORGANISATION

TERMS OF APPROVAL

Reference: [MEMBER STATE CODE (*)].MG.XXXX
(ref. AOC XX.XXXX)

Organisation: [COMPANY NAME AND ADDRESS]

Aircraft type/series/group	Airworthiness review authorised	Permits to fly authorised	Organisation(s) working under quality system
	[YES/NO] (***)	[YES/NO] (***)	
	[YES/NO] (***)	[YES/NO] (***)	
	[YES/NO] (***)	[YES/NO] (***)	
	[YES/NO] (***)	[YES/NO] (***)	

These terms of approval are limited to that specified in the scope of work contained in the approved Continuing Airworthiness Management Exposition section ……

Continuing Airworthiness Management Exposition Reference: ……..

Date of original issue: ……

Signed: ……..

Date of this revision: …… Revision No: ……

For the Competent Authority: [COMPETENT AUTHORITY OF THE MEMBER STATE *]

EASA Form 14-MG Issue 5

(*) Or EASA if EASA is the competent authority

(**) Delete for non-EU Member State or EASA

(***) Delete as appropriate if the organisation is not approved.

Form 7-7B. EASA Form 14 Page 2 describing the organizations scope of approval.

Part A — PILOT-OWNER MAINTENANCE TASKS FOR POWERED AIRCRAFT (AEROPLANES)

ATA	Area	Task	Aeroplanes
09	Towing	Tow release unit and tow cable retraction mechanism — cleaning, lubrication and tow cable replacement (including weak links)	Yes
		Mirror — installation and replacement of mirrors	Yes
11	Placards	Placards, markings — installation and renewal of placards and markings required by the AFM and the AMM	Yes
12	Servicing	Those items not requiring a disassembly of other than non-structural items, such as cover plates, cowlings and fairings — lubrication	Yes
20	Standard practices	Safety wiring — replacement of defective safety wiring or cotter keys, excluding those in engine controls, transmission controls and flight control systems	Yes
		Simple non-structural standard fasteners — replacement and adjustment, excluding the replacement of receptacles and anchor nuts requiring riveting	Yes
21	Air conditioning	Replacement of flexible hoses and ducts	Yes
23	Communication	Communication devices — remove and replace self-contained, instrument-panel-mounted communication devices with quick-disconnect connectors, excluding IFR operations	Yes**
24	Electrical power	Batteries — replacement and servicing	Yes
		Wiring — repairing broken circuits in non-critical equipment, excluding ignition system, primary generating system and required communication, as well as navigation system and primary flight instruments	Yes
		Bonding — replacement of broken bonding cable	Yes

Form 7-8. Limited tasks of the Pilot Owner examples.

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Question 7-1
The purpose of an airworthiness directive is to restore an aircraft to standards specified in the _____.

Question 7-2
In addition to the competent authority, who may issue a Permit to Fly?

Question 7-3
The maintenance requirements of what type of aircraft are covered by Part M?

Question 7-4
Who is ultimately responsible to insure that emergency equipment onboard an aircraft is serviceable?

Question 7-5
Following any modifications or repair, the CAMO station must ensure delivery of what to the pilot in command?

Question 7-6
Who is responsible to conduct a maintenance flight check, and at what point in the maintenance process is it carried out?

Question 7-7
What is meant by a component's "hard time"?

Question 7-8
Which categories of maintenance checks are typically performed at the airport gate or within the operator's on site hangar?

Question 7-9
By when must a manufacturer issued service bulletin be complied with?

Question 7-10
What is the purpose of EASA Form 1?

SUBMODULE 7 PRACTICE ANSWERS

Answer 7-1
Certification Specifications

Answer 7-2
An appropriately approved design, production or CAMO organization.

Answer 7-3
All aircraft, except those covered by Part ML.

Answer 7-4
The aircraft owner.

Answer 7-5
A renewed mass and balance statement.

Answer 7-6
The aircraft operator conducts the flight check after maintenance is completed, but before the CRS is issued.

Answer 7-7
A specific number (time in service or number of cycles) at which time the component must be serviced or replaced.

Answer 7-8
A checks and B checks.

Answer 7-9
At the owner's or operators discretion; if at all.

Answer 7-10
Form 1 is the Certificate of Return to Service (CRS) following maintenance.

Oversight Principles in Continuing Airworthiness

Submodule 8

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		A1
10.8	Oversight Principles in Continuing Airworthiness	1

10.8 - OVERSIGHT PRINCIPLES IN CONTINUING AIRWORTHINESS

Oversight principles in continuing airworthiness are fundamental to ensuring the ongoing safety and reliability of aircraft throughout their operational lifespan. This oversight, typically conducted by aviation regulatory authorities, encompasses a range of practices and principles aimed at maintaining high safety standards in aviation. Key oversight elements are:

- The quality system of the organization.
- The oversight performed by the competent authority issuing the organization approval.
- Airworthiness reviews performed on the aircraft for the renewal of the airworthiness review certificate.
- The ACAM (Aircraft Continuing Airworthiness Monitoring) program of the state of registry.

AIRCRAFT CONTINUING AIRWORTHINESS MONITORING (ACAM)

In order to have satisfactory oversight of aircraft airworthiness, the competent authorities are required to implement aircraft continuing airworthiness monitoring. National aviation authorities shall sample aircraft from the national register and check whether they are in satisfactory airworthy condition, while also assessing the owner/user in the terms of aircraft continuing airworthiness maintenance and compliance with the requirements of the approval. The ACAM process involves ongoing inspections and assessments, which guarantee that the aircraft will remain fit for flight throughout their operational life. It is a systematic and comprehensive approach to monitor and maintain the airworthiness of an aircraft fleet. It encompasses a wide range of activities including inspections, evaluations, documentation checks and regulatory compliance checks.

The five key components of ACAM include:

1. Inspections - regular inspections of aircraft components, systems and structures are fundamental aspect of ACAM. This inspection aims to identify and rectify any issues or discrepancies promptly.
2. Maintenance records - maintenance records play a crucial role in an aircraft. Operators are required to maintain comprehensive records of all maintenance and repairs performed on the aircraft.
3. Regulatory compliance - ACAM ensures that the aircraft adhere to the latest aviation regulations and standards. Any changes in regulations are promptly incorporated into the monitoring process to guarantee compliance.
4. Component reliability - ACAM also includes monitoring the reliability and performance of individual aircraft components. This includes engines, avionics, landing gear and many other aircraft components.
5. Safety assessments - periodic safety assessments are conducted to evaluate the overall safety of the aircraft. This assessment includes reviewing incident reports, analyzing maintenance data and identifying potential safety risks.

OVERSIGHT PRINCIPLES REGULATIONS

REG. EU 2021/1963 OVERSIGHT PRINCIPLES

The competent authority shall verify:

1. Compliance with the requirements that are applicable to organizations, prior to issuing an organization certificate;
2. Continued compliance with the applicable requirements of the organizations it has certified;
3. The implementation of appropriate safety measures mandated by the competent authority in accordance with points 145.B.135(c) and (d).

ED DECISION 2022/011/R - MANAGEMENT SYSTEM ASSESSMENT

As part of the initial certification of an organization, the competent authority should assess the organization's management system and processes to make sure that all the required enablers of a functioning management system are present and suitable.

As part of its continuing oversight activities, the competent authority should verify that the required enablers remain present and operational, and assess the effectiveness of the organization's management system and processes. When significant changes take place in the organization, the competent authority should determine whether there is a need to review the existing assessment to ensure that it is still valid.

INFORMATION DEEMED NECESSARY FOR OVERSIGHT

This information should include, as a minimum:

a. Any occurrence reports received by the competent authority;
b. The reports received following the issuing of any one off certification authorizations as defined in point 145.A.30(j)(5);
c. The results of the following types of inspections and surveys if they indicate an issue that originates from a Part145 organization:
   - Ramp inspections performed in accordance with Subpart RAMP of Annex II (Part-ARO) to Commission Regulation EU 965/2012 on air operations;
   - Product surveys of aircraft, pursuant to point M.B.303 or point ML.B.303;
   - Product audits conducted pursuant to point CAMO.B.305(b)(1) or point 145.B.305(b)(1);
   - Physical surveys or partial airworthiness reviews performed by the competent authority in line with AMC M.B.901.

REG. EU 2021/1963 - OVERSIGHT PROGRAM

a. The competent authority shall establish and maintain an oversight program covering the oversight activities required by point 145.B.300.
b. The oversight program shall take into account the specific nature of the organization, the complexity of its activities, the results of past certification or oversight activities, or both, and it shall be based on the assessment of the associated risks. It shall include, within each oversight planning cycle:
   1. Assessments, audits and inspections, including, as appropriate:
      - management system assessments and process audits;
      - product audits of a relevant sample of the maintenance carried out by the organization;
      - sampling of the airworthiness reviews performed;
      - unannounced inspections;
   2. Meetings convened between the accountable manager and the competent authority to ensure that both parties remain informed of all significant issues.
c. The oversight planning cycle shall not exceed 24 months.
d. The oversight planning cycle may be extended to 36 months if the competent authority has established that during the previous 24 months:
   - The organization has demonstrated that it can effectively identify aviation safety hazards and manage the associated risks.
   - The organization has continuously demonstrated compliance with point 145.A.85 and it has full control over all changes.
   - No level 1 findings have been issued.
   - All corrective actions have been implemented within the time period that was accepted or extended by the competent authority as provided for in point 145.B.350.
e. The oversight planning cycle may be shortened if there is evidence that the safety performance of the organization has decreased.
f. The oversight program shall include records of the dates when assessments, audits, inspections and meetings are due, and when assessments, audits, inspections and meetings have been effectively carried out.
g. At the completion of each oversight planning cycle, the competent authority shall issue a recommendation report on the continuation of the approval, reflecting the results of the oversight.

ED DECISION 2022/011/R - ANNUAL REVIEW

a. The oversight planning cycle and the related oversight program for each organization should be reviewed annually to ensure that they remain adequate regarding any changes in the nature of the organization, the complexity of its activities or the safety performance of the organization.
b. When reviewing the oversight planning cycle and the related oversight program, the competent authority should also consider any relevant information collected in accordance with points 145.A.60 and 145.B.300(f).

ED DECISION 2022/011/R - SUBCONTRACTED ACTIVITIES

If a Part-145 organization subcontracts maintenance tasks, the competent authority should determine whether the subcontracted organization needs to be audited and included in the oversight program, taking into account the specific nature and complexity of the subcontracted activities, the results of previous oversight activities of the approved organization, and the assessment of the associated risks.

For such audits, competent authority inspectors should ensure that they are accompanied throughout the audit by a senior technical member of the Part-145 organization.

ED DECISION 2022/011/R - OVERSIGHT PLANNING CYCLE

a. When determining the oversight planning cycle and defining the oversight program, the competent authority should assess the risks related to the activity and set-up of each organization, and adapt the oversight to the level of risk identified and to the effectiveness of the organization's management system, in particular its ability to effectively manage safety risks.
b. The competent authority should establish a schedule of audits and inspections that is appropriate to each organization. The planning of audits and inspections should take into account the results of the hazard identification and the risk assessment conducted and maintained by the organization as part of the organization's management system. Inspectors should work in accordance with the schedule provided to them.
c. When the competent authority, having regard to the level of risk identified and the effectiveness of the organization's management system, varies the frequency of an audit or inspection, it should ensure that all aspects of the organization's activity are audited and inspected within the applicable oversight planning cycle.

ED DECISION 2022/011/R – AUDIT

a. For each organization certified by the competent authority, all applicable requirements including relevant processes should be audited at periods that do not exceed the applicable oversight planning cycle. The beginning of the first oversight planning cycle is normally determined by the date of issue of the first certificate. If the competent authority wishes to align the oversight planning cycle with the calendar year, it should shorten the first oversight planning cycle accordingly.
b. Audits should include at least one onsite audit within each oversight planning cycle. For organizations that carry out their regular activities at more than one site, the determination of the sites and the requirements at these sites to be audited should consider the results of past oversight activities and the volume of activities at each site, as well as the main risk areas identified.
c. For organizations that hold more than one certificate under Regulation EU 2018/1139, the competent authority may define an integrated oversight schedule that includes all the applicable audit items. In order to avoid any duplication of audits, credit may be granted for specific audit items that have already been completed during the current oversight planning cycle, provided that:
   - The specific audit item is the same for all the certificates under consideration.
   - There is satisfactory evidence on record that those specific audit items were carried out, and that all the related corrective actions have been implemented to the satisfaction of the competent authority.
   - The competent authority is satisfied that there is no evidence that standards have deteriorated regarding those specific audit items for which credit is granted.

ED DECISION 2022/011/R - EXTENSION OF THE OVERSIGHT PLANNING CYCLE BEYOND 24-MONTHS

a. If the competent authority applies an oversight planning cycle that exceeds 24-months, it should, at a minimum, perform one focused inspection of the organization (inspection of a specific area, element or aspect of the organization) within each 12-month segment of the applicable oversight planning cycle to support the extended oversight program.
b. If the results of this inspection indicate a decrease in the safety performance or regulatory compliance of the organization, the competent authority should revert back to a 24-month (or less) oversight planning cycle and review the oversight program accordingly.
c. In order to be able to apply an oversight planning cycle beyond 36-months, the competent authority should agree on the format and contents of the continuous reporting to be made by the organization on its safety performance and regulatory compliance.

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Question 8-1
Aircraft Continuing Airworthiness Monitoring process involve ongoing _____ and _____, which guarantee that aircraft will remain fit for flight throughout their operational life.

Question 8-2
What are the five key components of Aircraft Continuing Airworthiness Monitoring?

Question 8-3
The oversight planning cycle and the related oversight program for each organization should be reviewed _____.

Question 8-4
Who establishes and maintains an oversight program covering the oversight activities?

Question 8-5
For each organization certified by the competent authority, all applicable requirements including relevant processes should be audited at periods that do not exceed the applicable _____.

Question 8-6
In what way can a level 1 finding affect the oversight planning cycle?

Question 8-7
Who determines the extent to which a subcontractor to a Part 145 organization must be audited?

SUBMODULE 8 PRACTICE ANSWERS

Answer 8-1
inspections and assessments

Answer 8-2
- Inspections
- Maintenance records
- Regulatory compliance
- Component reliability
- Safety assessments

Answer 8-3
Annually.

Answer 8-4
Competent Authority

Answer 8-5
oversight planning cycle

Answer 8-6
It may be shortened at the discretion of the national authority.

Answer 8-7
The competent authority.

Maintenance and Certification Beyond Current EU Regulations

Submodule 9

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		A1
10.9	**Maintenance and Certification Beyond Current EU Regulations (if not superseded by EU requirements)** Maintenance of European Union aircraft that are not within the scope of Regulation (EU) 2018/1139 (Annex I aircraft); European military airworthiness requirement (EMAR) 66 licence; Applicable national and international requirements for component maintenance, welding, painting, NDT, etc., (if not superseded by EU requirements).	-

10.9 - MAINTENANCE AND CERTIFICATION BEYOND CURRENT EU REGULATIONS

This submodule is not required for Cat-A Licensing.

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Cybersecurity in Aviation Maintenance

Submodule 10

SUBMODULE KNOWLEDGE DESCRIPTIONS		LEVEL
		A1
10.10	**Cybersecurity in Aviation Maintenance** Regulation on the introduction of organisation requirements for the management of information security risks related to aeronautical information systems used in civil aviation.	1

10.10 - CYBERSECURITY IN AVIATION MAINTENANCE

CYBERSECURITY IN AVIATION MAINTENANCE

The aerospace industry has increasingly become a prime target for cyberattacks, primarily because of its dependence on highly interconnected digital systems, extensive global supply chains, and the substantial amount of sensitive information it processes. The Maintenance, Repair, and Overhaul (MRO) sector is particularly vulnerable to cyber threats for several reasons. MROs have access to major airlines as well as manufacturers of engines and components. Although MROs may not be the direct target of cybercriminals, they can serve as a gateway for attacks on the aircraft.

SECURING AERONAUTICAL INFORMATION SYSTEMS

The aviation sector has experienced a digital transformation over the last 15 to 20 years, encompassing everything from airline operations to aircraft, ground systems, and their interconnected networks. With the implementation of these digital systems and advanced technologies, the industry must adopt essential cybersecurity measures to maintain safety, reliability, and resilience.

The primary objective of aviation cybersecurity is to safeguard aircraft and their associated systems from potential cyber threats. This involves protecting the safety and integrity of communication, navigation, and operational systems onboard the aircraft.

Cybersecurity plays a crucial role in ensuring that data transmitted from an aircraft to organizational networks remains secure, thereby preventing unauthorized access and information theft. Continuous risk mitigation is a fundamental aspect of cybersecurity efforts.

TYPES OF CYBER-ATTACKS

Aviation Maintenance, Repair, and Overhaul (MRO) organizations role is critical for the safety and efficiency of aircraft operations. MRO organizations face a range of cyber threats, including ransomware, phishing, data breaches, exploitation of IT vulnerabilities, insider threats, and DDoS attacks. Understanding the most common types of cyber threats can help implement effective defenses.

RANSOMWARE ATTACKS

Ransomware is one of the most significant threats to MRO organizations. In these attacks, cybercriminals encrypt critical data and demand a ransom for its release. Ransomware can disrupt maintenance schedules, compromise sensitive information, and lead to substantial financial losses. The aviation sector has seen a sharp increase in ransomware incidents, with attackers often targeting the interconnected systems used in aircraft maintenance.

PHISHING ATTACKS

Phishing attacks involve tricking individuals into providing sensitive information, such as login credentials or financial details, by posing as a trustworthy entity. MRO staff are often targeted through emails that appear to be from legitimate sources. Successful phishing attacks can lead to unauthorized access to systems, data breaches, and financial fraud.

DATA BREACHES

Data breaches occur when cybercriminals gain unauthorized access to sensitive information. In the context of MRO organizations, this can include maintenance records, operational data, and personal information of employees. Data breaches can result in the theft of intellectual property, regulatory fines, and damage to the organization's reputation.

EXPLOITATION OF IT VULNERABILITIES

Cybercriminals often exploit vulnerabilities in software and hardware to gain access to systems. These vulnerabilities can exist in operating systems, applications, or even the interconnected devices used in aircraft maintenance. Exploiting these weaknesses can allow attackers to disrupt operations, steal data, or manipulate maintenance processes.

INSIDER THREATS

Insider threats involve malicious actions taken by employees or individuals with access to the organization's systems. These threats can be intentional, such as sabotage, data theft, or unintentional, such as accidental disclosure of sensitive information. Insider threats are particularly challenging to detect and mitigate.

DISTRIBUTED DENIAL OF SERVICE (DDOS) ATTACKS

DDoS attacks aim to overwhelm an organization's network by flooding it with excessive traffic, causing disruptions to services. For MRO organizations, DDoS attacks can hinder access to critical systems and delay maintenance operations. These attacks can be particularly damaging if they target systems that manage aircraft schedules and maintenance records

PREVENTING CYBERATTACKS

MRO organizations must implement a comprehensive set of cybersecurity measures to protect their operations and data. By adopting network segmentation, regular software updates, employee training, IDPS, data encryption, security audits, incident response plans, they can significantly enhance their cybersecurity defenses.

NETWORK SEGMENTATION AND ACCESS CONTROL

One of the fundamental cybersecurity measures is network segmentation. By dividing the network into smaller, isolated segments, MRO organizations can limit the spread of cyberattacks. Access control mechanisms should be implemented to ensure that only authorized personnel have access to specific segments of the network. This reduces the risk of unauthorized access to critical systems and sensitive data.

REGULAR SOFTWARE UPDATES AND PATCH MANAGEMENT

Keeping software and systems up to date is crucial in defending against cyber threats. MRO organizations should establish a robust patch management process to ensure that all software, including operating systems and applications, are regularly updated with the latest security patches. This helps to close vulnerabilities that cybercriminals could exploit.

EMPLOYEE TRAINING AND AWARENESS PROGRAMS

Human error is often a significant factor in cybersecurity breaches. MRO organizations should invest in comprehensive training and awareness programs for their employees. These programs should educate staff about common cyber threats, such as phishing and social engineering, and provide guidelines on how to recognize and respond to these threats. Regular training sessions can help create a culture of cybersecurity awareness within the organization.

IMPLEMENTATION OF INTRUSION DETECTION AND PREVENTION SYSTEMS (IDPS)

Intrusion Detection and Prevention Systems (IDPS) are essential tools for monitoring network traffic and identifying potential cyber threats. By implementing IDPS, MRO organizations can detect and respond to suspicious activities in real-time, preventing cyberattacks before they cause significant damage. These systems can also provide valuable insights into the nature of the threats, helping to improve overall cybersecurity strategies.

DATA ENCRYPTION

Encryption plays a strong role in cybersecurity, and is vital to ensure the integrity and confidentiality of data within aircraft systems. Encryption plays a key role in digital signatures that the industry relies on for maintenance and configuration control such as ensuring that software parts have not been modified, that LRUs are correctly adopted by the aircraft, and that PDLs are correctly authenticated. Many aircraft systems currently lack adequate encryption, exposing them to potential cyber threats.

SECURE COMMUNICATION

Secure communication protocols, such as HTTPS and VPNs, should be used to protect data transmitted over the internet. This helps to safeguard maintenance records, operational data, and other sensitive information from cyber threats.

REGULAR SECURITY AUDITS AND VULNERABILITY ASSESSMENTS

Conducting regular security audits and vulnerability assessments is essential to identify and address potential weaknesses in the cybersecurity infrastructure. MRO organizations should perform these assessments periodically to ensure that their systems and processes are secure. External audits by third-party cybersecurity experts can provide an unbiased evaluation of the organization's security posture and recommend improvements.

INCIDENT RESPONSE AND RECOVERY PLANS

Having a well-defined incident response and recovery plan is crucial for minimizing the impact of cyberattacks. MRO organizations should develop and regularly update their incident response plans to ensure a swift and effective response to cybersecurity incidents. These plans should include procedures for identifying, containing, and mitigating cyber threats, as well as steps for recovering affected systems and data.

PERSONAL PROTECTION AGAINST CYBERATTACKS

Personal protection against cyberattacks involves a combination of strong passwords, multifactor authentication, regular software updates, cautious email and internet practices, data backups, and ongoing education. By adopting these practices, individuals can significantly reduce risk of cyberattacks in their organization.

STRONG PASSWORDS AND MULTIFACTOR AUTHENTICATION

One of the fundamental steps in protecting oneself from cyberattacks is the use of strong, unique passwords. A strong password typically includes a combination of letters (both uppercase and lowercase), numbers, and special characters. Using a password manager can help generate and store complex passwords securely. Additionally, enabling multifactor authentication (MFA) adds an extra layer of security. MFA requires not only a password but also a second form of verification, such as a code sent to your phone, making it significantly harder for attackers to gain access.

REGULAR SOFTWARE UPDATES

Keeping software up to date is another critical aspect of cybersecurity. Software updates often include patches for security vulnerabilities that cybercriminals can exploit. Regularly updating your operating system, applications, and antivirus software ensures that you have the latest protections against known threats.

EMAIL AND INTERNET CAUTION

Phishing attacks, where attackers trick individuals into providing sensitive information, are common. Being cautious with emails and avoiding clicking on links or downloading attachments from unknown or suspicious sources can prevent many cyberattacks. Similarly, using secure networks and avoiding public Wi-Fi for sensitive transactions can protect against data interception. When necessary, using a Virtual Private Network (VPN) can encrypt your internet connection, adding an additional layer of security.

DATA BACKUP

Regularly backing up important data is a crucial step in mitigating the impact of ransomware attacks, where attackers lock your data and demand payment for its release. By keeping backups on external drives or cloud services, you can restore your data without having to pay the ransom.

EDUCATION AND AWARENESS

Staying informed about the latest cyber threats and learning how to recognize and respond to them is vital. Cybersecurity is an ever-evolving field, and new threats emerge regularly. By educating yourself and staying aware of current trends, you can better protect yourself against potential attacks.

AVIATION CYBERSECURITY REGULATIONS AND STANDARDS

Both EASA and the FAA have issued new regulations that mandate proactive assessment and mitigation of potential cyber vulnerabilities in aviation. These regulations are designed to ensure that airlines and other aviation stakeholders take necessary steps to protect aircraft and associated systems from cyber threats.

FEDERAL AVIATION ADMINISTRATION (FAA)

The current trend in airplane design includes an increasing level of integration of airplane, engine, and propeller systems with increased connectivity to internal or external data networks and services. Regulators and industry must constantly monitor the cybersecurity threat environment in order to identify and mitigate new threat sources. These designs can introduce or allow cybersecurity vulnerabilities from sources such as:

- Field Loadable Software;
- Maintenance laptops;
- Airport or airline gate link networks;
- Public networks, e.g., internet;
- Wireless aircraft sensors and sensor networks;
- Cellular networks;
- Universal Serial Bus (USB) devices;
- Satellite communications;
- Portable electronic devices and portable electronic flight bags (EFBs); and
- GPS and satellite-based augmentation system digital data.

The FAA has found that its current airworthiness regulations are inadequate and inappropriate to address the cybersecurity vulnerabilities caused by increased interconnectivity.

In 2024, the FAA proposed to add new regulations and revise certain existing regulations in title 14, Code of Federal Regulations (14 CFR) part 25 (Airworthiness Standards: Transport Category Airplanes), part 33 (Airworthiness Standards: Aircraft Engines), and part 35 (Airworthiness Standards: Propellers). This proposed rulemaking imposes new design standards to address cybersecurity threats for transport category airplanes, engines, and propellers.

These changes introduce type certification and continued airworthiness requirements to protect the equipment, systems and networks of transport category airplanes, engines and propellers against intentional unauthorized electronic interactions (IUEI) that could create safety hazards. Design approval applicants would be required to identify, assess and mitigate such hazards, and develop Instructions for Continued Airworthiness (ICA) that would ensure such protections continue in service. Proposed changes to parts 25, 33, and 35 mandate such protection and apply to applicants for design approval of transport category airplanes, engines and propellers.

EASA/EU REGULATION

The introduction of EASA Part-IS (Information Security), aligned with Regulation (EU) 2023/203, establishes mandatory cybersecurity requirements to safeguard aviation organizations, including Continuing Airworthiness Management Organizations (CAMOs) and, Part-145 maintenance organizations, along with other stakeholders.

EASA REGULATIONS PART IS

Part-IS compliance involves aligning EASA's cybersecurity framework with existing aviation safety regulations such as Part-145, Part-CAMO, and SMS requirements. [**Figure 10-1**]

Figure 10-1. EASA Easy Access Rules for Part-IS.

The regulation applies to several organizations, including:

- Part-145 Maintenance Organizations (excluding certain smaller entities).
- Continuing Airworthiness Management Organizations (CAMOs).
- Approved Training Organizations (ATOs) and Air Navigation Service Providers (ANSPs), among others.
- Organizations that consider Part-IS is not applicable/ outside its scope can request derogations under specific provisions.
- EASA Regulations Part IS require airlines to address cybersecurity comprehensively and start proactively monitoring and mitigating cyber threat. This regulation has significant implications for MRO organizations, which must satisfy following requirements:
- Information Security Management: MRO organizations must implement robust information security management systems to protect their ICT systems and data used in aviation. This includes identifying and managing information security risks.
- Incident Response: MROs are required to have procedures in place for detecting, responding to, and recovering from information security incidents. This ensures that any disruptions to maintenance operations are minimized and aviation safety is maintained.
- Compliance and Audits: MROs will need to comply with the new regulations and may be subject to audits by EASA to ensure adherence to Part-IS requirements.
- Training and Awareness: Personnel within MRO organizations must be trained and made aware of information security practices and protocols. This is crucial for maintaining a secure environment.

REGULATION (EU) 2023/203

Regulation (EU) 2023/203 lays down rules for the application of Regulation (EU) 2018/1139, focusing on the management of information security risks that could impact aviation safety. It introduces specific cybersecurity risk management measures that aviation entities must incorporate into their operations. These measures directly impact maintenance environments, aircraft systems, and IT/OT infrastructures, requiring organizations to adopt a systematic approach to cybersecurity compliance.

Regulation (EU) 2023/203 mandates several key requirements for aviation organizations and competent authorities to manage information security risks:

- Information Security Management Systems (ISMS): Organizations must establish and maintain ISMS that integrates cybersecurity into safety risk management frameworks.
- Implementation of structured cybersecurity risk assessment covering IT (Information Technology) and OT (Operational Technology) systems such as Aircraft Health Monitoring Systems (AHMS) and Maintenance, Repair, and Overhaul (MRO) software.
- Regular cybersecurity training and awareness programs tailored to aviation maintenance staff in compliance with Regulation (EU) 2023/203.
- Stricter requirements for cybersecurity risk management in aviation supply chains.
- Third-party vendors are required to adhere to strict cybersecurity standards (e.g., ISO 27001, NIST cybersecurity framework), as mandated by Regulation (EU) 2023/203.
- Aviation entities to implement structured incident response procedures and ensure timely reporting of cyber incidents.

INFORMATION SECURITY MANAGEMENT SYSTEM (ISMS)

An Information Security Management System (ISMS) is a framework tool designed for organizations to enhance the security of their information, data, and systems. An ISMS includes various components, from the people in organization to technical security measures. For aviation MRO organizations, implementing an ISMS is crucial to protect against cyber threats and ensure compliance with regulations like EASA Part-IS.

The primary objective of this system is to limit the impact of security breaches and make sure the confidentiality, integrity, and availability of data by implementing risk management processes, security controls, and policies.

RISK IDENTIFICATION

This initial stage involves identifying the organization's critical assets, potential threats, and vulnerabilities. It includes understanding what data, systems, or other assets are crucial to the organization and what risks they face.

RISK ASSESSMENT

Once risks are identified, they need to be assessed to determine their potential impact and likelihood. This involves evaluating the severity of each risk and prioritizing them based on their potential to harm the organization. [**Figure 10-2**]

RISK MANAGEMENT STRATEGY

Once a risk has been assessed and analyzed, an organization will need to select treatment options:

- Remediation: Implementing a control that fully or nearly fully fixes the underlying risk.
  Example: You have identified a vulnerability on a server where critical assets are stored, and you apply a patch for that vulnerability.
- Mitigation: Lessening the likelihood and/or impact of the risk, but not fixing it entirely.
  Example: You have identified a vulnerability on a server

Figure 10-2. The stages of information security management.

where critical assets are stored, but instead of patching the vulnerability, you implement a firewall rule that only allows specific systems to communicate with the vulnerable service on the server.

- Transference: Transferring the risk to another entity so your organization can recover from incurred costs of the risk being realized.
  Example: You purchase insurance that will cover any losses that would be incurred if vulnerable systems are exploited. (Note: this should be used to supplement risk remediation and mitigation but not replace them altogether.)
- Risk acceptance: Not fixing the risk. This is appropriate in cases where the risk is clearly low and the time and effort it takes to fix the risk costs more than the costs that would be incurred if the risk were to be realized.
  Example: You have identified a vulnerability on a server but concluded that there is nothing sensitive on that server; it cannot be used as an entry point to access other critical assets, and a successful exploit of the vulnerability is very complex. As a result, you decide you do not need to spend time and resources to fix the vulnerability.
- Risk avoidance: Removing all exposure to an identified risk.
  Example: You have identified servers with operating systems (OS) that are about to reach end-of-life and will no longer receive security patches from the OS creator. These servers process and store both sensitive and non-sensitive data. To avoid the risk of sensitive data being compromised, you quickly migrate that sensitive data to newer, patchable servers. The servers continue to run and process non-sensitive data while a plan is developed to decommission them and migrate non-sensitive data to other servers.

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Question 10-1
What is the greatest objective of aviation cybersecurity?

Question 10-2
While preparing to perform a task on an aircraft, you are handed an unknown ipad or laptop. What is your first concern?

Question 10-3
Name some ways in which an organization can help prevent cyber attacks.

Question 10-4
What is critical for an organization which has suffered a cyber attack?

Question 10-5
What is the basis of Regulation 2023/203?

Question 10-6
What are the three basic steps of a risk management strategy?

SUBMODULE 10 PRACTICE ANSWERS

Answer 10-1
To safeguard an aircraft's operation and navigation systems while in flight.

Answer 10-2
Has that device been affected by a cyber attack.

Answer 10-3
Isolate devices from other, regular software updates, Intrusion detection and prevention systems (IDPS), regular security audits, employee training.

Answer 10-4
That a previously defined response plan exists within the organization to contain the attack.

Answer 10-5
Regulation 2023/203 specifies EASA's cybersecurity requirements within aviation organizations.

Answer 10-6
- Identify the possible risks.
- Determine level of danger of each risk.
- Devise methods to prevent or reduce the risk.

ACRONYM DEFINITIONS

This is a list of the acronyms used throughout this book. This is not a complete list of acronyms used in aviation.

ACAM Aircraft Continuing Airworthiness Monitoring
AD Airworthiness Directive
AltMoC Alternative Means of Compliance
AMC Acceptable Means of Compliance
AML Aircraft Maintenance License
AMP Aircraft Maintenance Program
AOC Air Operators Certificate
APU Auxiliary Power Unit
ARC Airworthiness Review Certificate
ARS Airworthiness Review Staff
ATC Air Traffic Control
CAE Combined Airworthiness Exposition
CAME Continuing Aircraft Management Exposition
CAMO Continued Airworthiness Management Organization
CAMP Continuous Airworthiness Maintenance Program
CAO Combined Airworthiness Organization
CAT Commercial Air Transport
CDL Configuration Deviation List
CG Center of Gravity
CMM Component Maintenance Manual
COA Certificate of Airworthiness
CRS Certificate of Release to Service
CS Certification Specifications
DDoS Distributed Denial of Service Attacks
EASA European Aviation Safety Agency
EC European Community
ECR European Central Repository
EDTO Extended Diversion Time Operations
EMAR European Military Airworthiness Requirements
ETOPS Extended Range Twin Engine Operations
ETSO European Technical Standard Order
EU European Union
GA General Aviation
GM Guidance Material
ICAO International Civl Aviation Organization
ICS Independent Certifying Staff
ICT Information and Communication Technology
IDPS Intrusion Detection and Prevention Systems
IR Implementing Rules
ISMS Information Security Management System
MAML Military Aviation Authority
MCF Maintenance Flight Check
MEL Minimum Equipment List
MFA Multi Factor Authentication
MMEL Master Minimum Equipment List
MOE Maintenance Organization Exposition
MTOM Maximum Takeoff Mass
NAA National Aviation authority
NCO Non Commercial Operations
NDT Non Destructive Testing
NOTAM Notice to Airmen
OJT On the Job Training
PBN Performance Based Navigation
PICAO Provisional International Civil Aviation Organization
RNAV Radio Navigation
RNP Required Navigation Performance
SARP Standards and Recommended Practices
SB Service Bulletin
SL Service Letter
SMS Safety Management Systems
SSP State Safety Program
STC Supplemental Type Certificate
TCDS Type Certificate Data Sheet
TCH Type Certificate Holder
TeBs Technical Bodies
TR Type Rating