Part 66 Cat. B1 / B2 Module 10

AVIATION LEGISLATION

Vilnius-2017
10.1 REGULATORY FRAMEWORK

Aviation is one of the most complex systems of interaction between human being and machines. Being everyday international transport communication it cannot function avoiding common rules and procedures. Precision in procedures and systems is made possible by the existence of universally accepted standard and regulations.

Role of International Civil Aviation Organization

The International Civil Aviation Organization (ICAO) is a United Nations specialized agency, created in 1944 in Chicago upon the signing of the Convention on International Civil Aviation (Chicago Convention). ICAO works with the Convention's 191 Member States and global aviation organizations to develop international Standards and Recommended Practices (SARPs) which States reference when developing their legally enforceable national civil aviation regulations. There are currently over 10 000 SARPs reflected in the 19 Annexes to the Chicago Convention which ICAO oversees, and it is through these provisions - as well as ICAO's complementary policy, auditing and capacity-building efforts - that today's global air transport network is able to operate close to 100,000 daily flights, safely, efficiently and securely in every region of the world.

ICAO Vision and Mission

Vision

Achieve the sustainable growth of the global civil aviation system.

Mission

To serve as the global forum of States for international civil aviation. ICAO develops policies and Standards, undertakes compliance audits, performs studies and analyses, provides assistance and builds aviation capacity through many other activities and the cooperation of its Member States and stakeholders

ICAO 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 (GASP) outlines the key activities
Continuing Monitoring Approach

To determine the safety oversight capabilities of its member States, ICAO carries out continuous monitoring activities to:

1. Assess the effective implementation by the States of the eight CEs in eight audit areas, namely LEG, ORG, PEL, OPS, AIR, AIG, ANS and AGA (Fig. 1-2), using a set of Protocol Questions (PQs) for each audit area;

2. Verify the status of the States’ implementation of:
   - (a) Safety-related ICAO Standards and Recommended Practices (SARPs);
   - (b) Associated procedures;
   - (c) Guidance material; and
   - (d) Best safety practices.

The USOAP CMA has four components (Fig. 1-3) integral to the continuous monitoring by ICAO of the safety oversight capabilities of its Member States:

1) Safety information is collected through Member States and various internal and external stakeholders.

2) This information is analyzed to determine the safety risk profile of each State.

3) Based on the risk profile, ICAO selects and prioritizes the States which will receive corresponding USOAP CMA activities.

4) The results of the USOAP activities lead to updates of the Effective Implementation (EI) value of the States on the USOAP CMA online framework.

Figure 1-3. USOAP CMA components
Rulemaking

EASA uses a total system approach for rulemaking. This approach is based on the fact that the aviation system components – products, operators, crews, and aerodromes, ATM, ANS, on the ground or in the air – are part of a single network. Uniformity is achieved by common implementing rules (IR) adopted by the Commission. The aim of the total system approach (Fig. 1-4) is to eliminate the risk of safety gaps or overlaps and avoid conflicting requirements and confused responsibilities. Regulations are interpreted and applied in a standardized manner and best practices are provided. This allows the realization of increased interoperability of products and services. The total system approach also aims to streamline the certification processes and reduce the burden on regulated persons and organizations.

Figure 1-4. The total system approach used by EASA for rulemaking

EASA’s remit does not encompass questions related to civil aviation security e.g. airport security measures, counter-terrorism.

The whole rulemaking procedure step-by-step is shown on Fig. 1-5. Rulemaking process starts from 5-year Rulemaking Program (RM PROGR.) established by the EASA Executive Director after consultation with the Member States and other interested parties (as airlines, etc.). EASA bodies participating in program preparation are Management Board (MB), Rulemaking Advisory Group (RAG), Thematic Advisory Group (TAG) and Safety Standards Consultative Committee (SSCC). The TAG is formed especially for particular Rulemaking activity.
Relationship between the various Annexes (Parts) such as Part-21, Part-M, Part-145, Part-66, Part-147 and Regulation (EU) No 965/2012

In accordance with Part-21 requirements:
- Design and production organizations are certified;
- Type-certificates, restricted type-certificates or supplemental type-certificates are issued;
- Certificates of airworthiness, restricted certificates of airworthiness, permits to fly or authorized release certificates are issued.

Organizations and personnel involved in the continuing airworthiness of aircraft and components, including maintenance, have to comply with the provisions of Part-M.

Organizations involved in the maintenance of large aircraft or of aircraft used for commercial air transport, and components have to be approved in accordance with the provisions Part-145.

In accordance with the Part-66 requirements the aircraft maintenance licenses are issued and valid and certifying staff has to be qualified in accordance with the provisions of Part-66.

In accordance with Part-147 requirements maintenance training and examination organizations are approved to conduct training and examination as specified in Part-66.

In compliance with Regulation (EU) No 965/2012 on Air operations all aircraft of the operator of commercial air transport operations shall have a certificate of airworthiness. All aircraft operated have to comply with Commission Regulation (EU) No 1321/2014 (Part M, Part 145).

The graphical relationship between Parts mentioned above is given Fig. 1-12.

![Diagram]

Figure 1-12. Relationship between the Parts
### 10.2 CERTIFYING STAFF – MAINTENANCE

In the very beginning some definitions useful for further consideration could be given:

| **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 |
| **Complex motor-powered aircraft** | An airplane with a maximum certificated take-off mass exceeding 5 700 kg, or certificated for a maximum passenger seating configuration of more than nineteen, or certificated for operation with a minimum crew of at least two pilots, or equipped with (a) turbojet engine(s) or more than one turboprop engine |
| **ELA1 aircraft** | An airplane with a maximum take-off mass (MTOM) of 1 200 kg or less that is not classified as complex motor-powered aircraft |
| **ELA2 aircraft** | An airplane with a maximum take-off mass (MTOM) of 2 000 kg or less that is not classified as complex motor-powered aircraft |
| **LSA aircraft** | A light sport airplane which has all of the following characteristics: |
| | i. a Maximum take-off mass (MTOM) of not more than 600 kg; |
| | ii. a maximum stalling speed in the landing configuration (VS0) of not more than 45 knots Calibrated Airspeed (CAS) at the aircraft’s maximum certificated take-off mass and most critical center of gravity; |
| | iii. a maximum seating capacity of no more than two persons, including the pilot; |
| | iv. a single, non-turbine engine fitted with a propeller; |
| | v. a non-pressurized cabin. |
| **Certificate** | Shall mean any approval, license or other document issued as the result of certification |
| **Certifying staff** | Personnel responsible for the release of an aircraft or a component after maintenance |

SECTON A - TECHNICAL REQUIREMENTS

Subpart A. Aircraft Maintenance Licence

This section defines the aircraft maintenance license and establishes the requirements for application, issue and continuation of its validity.

66.A.3 Licence categories

Aircraft maintenance licenses described in 66.A.3 (a, b) are summarized in Fig. 2-1.

![Diagram of aircraft maintenance licence categories](image)

**Figure 2-1.** AML according to the technology used in the aircraft

Category B3 is applicable to piston-engine non-pressurized airplanes of 2 000 kg MTOM and below.

**GM.66.A.3**

*Individual aircraft maintenance licence holders need not be restricted to a single category. Provided that each qualification requirement is satisfied, any combination of categories may be granted.*

**Note:** Category A is the simplest one to qualify task-oriented maintenance mechanics. Category B1 is for base maintenance engineers-mechanical and B2 for base maintenance engineers-avionic. An individual aviation maintenance engineer can have A1 and B2, or A3 and B2 categories. B1 category combines category A. Category B2 does not contain category A. B2 maintenance engineer need to pass appropriate training and examination for category A.

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2 Here and later the titles used in Part-66 and other Parts are given in original writing - the text given in Italic means direct citation from relevant text
10.3. APPROVED MAINTENANCE ORGANISATION

In accordance with Article 4 „Maintenance organization approvals“, of the Commission Regulation (EU) No 1321/2014, organisations involved in the maintenance of large aircraft or of aircraft used for commercial air transport, and components intended for fitment thereto, shall be approved in accordance with the provisions of Part-145.

For the purpose of Part-145, the competent authority shall be:

- For organisations having their principal place of business in a Member State, the authority designated by that Member State, or;
- For organisations having their principal place of business located in a third country, the EASA.

Useful Definitions

| **Maintenance** | 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 pre-flight inspection |
| **Principal place of business** | the head office or the registered office of the undertaking within which the principal financial functions and operational control of the activities referred to in this Regulation are exercised |
| **Pre-flight inspection** | The inspection carried out before flight to ensure that the aircraft is fit for the intended flight |

Section A. Technical Requirements

With reference to 145.A.10 Section A establishes the requirements to be met by an organization to qualify for the issue or continuation of an approval for the maintenance of aircraft and components.

In accordance with AMC 145.A.10 Line Maintenance (Fig. 3-1) should be understood as any maintenance that is carried out before flight to ensure that the aircraft is fit for the intended flight.

**Figure 3-1.** Line and Base maintenance
A maintenance organization which employs only one person to both plan and carry out all maintenance can only hold a limited scope of approval rating. The maximum permissible limits are presented below.

<table>
<thead>
<tr>
<th>Class</th>
<th>Rating</th>
<th>Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft</td>
<td>A2 Airplanes 5 700 kg and below</td>
<td>Piston engine 5 700 kg and below</td>
</tr>
<tr>
<td>Aircraft</td>
<td>A3 Helicopters</td>
<td>Single piston engine 3 175 kg and below</td>
</tr>
<tr>
<td>Engines</td>
<td>B2 Piston</td>
<td>Less than 450 hp</td>
</tr>
<tr>
<td>Components</td>
<td>Other than complete engines or APU, C1 to C22</td>
<td>As per Capability List</td>
</tr>
<tr>
<td>Specialized</td>
<td>D1 NDT</td>
<td>NDT method(s) to be specified</td>
</tr>
</tbody>
</table>

However such an organization may be further limited by the competent authority in the scope of approval dependent upon the capability of the particular organization.

**145.A.25 Facility requirements**

The organisation shall ensure that:

(a) Facilities are provided appropriate for all planned work, ensuring in particular, protection from the weather elements. Specialised 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. [. . .]

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/other airborne contamination results in visible surface contamination, all susceptible systems are sealed until acceptable conditions are re-established.

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/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 authorised personnel.

AMC 145.A.25 (a)

4. Aircraft maintenance staff should be provided with an area where they may study maintenance instructions and complete maintenance records in a proper manner.

The area for aircraft maintenance staff to study maintenance manuals and do the other paperwork may be organized not only as separate premises, but as computerized workplaces directly near base maintenance of aircraft.

Schematically the requirements presented above (145.A.25; AMC 145.A.25) are shown on Fig. 3-5.
145.A.30 Personnel requirements

Part-145 organization has to 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 Part-145.

**Note:** Accountable Manager usually means Chief Executing Officer (C.E.O.) of the Maintenance Organization

The accountable manager shall:

- Ensure that all necessary resources are available to accomplish maintenance to support the organization approval;
- Establish and promote the safety and quality policy;
- Demonstrate a basic understanding of Part-145.

The organization shall nominate a person or group of persons, whose responsibilities include ensuring that the organization complies with Part-145. Such person(s) shall ultimately be responsible to the accountable manager.

The person or persons nominated shall:

- represent the maintenance management structure of the organization and be responsible for all functions specified in this Part;
- be identified and their credentials submitted in a form and manner established by the competent authority;
The authorisation issued to certifying staff by the organisation and which specifies the fact that they may sign certificates of release to service within the limitations stated in such authorisation on behalf of the approved organisation.

According to AMC145.A.35(a)(2) the sentence "the organisation 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" means that the person has received training and has been successfully assessed on:
- The type of aircraft or component;
- The differences on (the particular model/variant, the particular configuration).

AMC 145.A.35(b)
The organisation issues the certification authorisation when satisfied that compliance has been established with the appropriate paragraphs of Part-145 and Part-66. In granting the certification authorisation the maintenance organization approved under Part-145 needs to be satisfied that the person holds a valid Part-66 aircraft maintenance licence and may need to confirm such fact with the competent authority of the Member State that issued the licence.

The visual description of the „road to CRS“ is presented on Fig. 3-7 and the possible form of Company Certification Authorization – on Fig. 3-8.

![Figure 3-7. Becoming a certified maintenance engineer](image-url)
145.A.42 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 (Note: This will be discussed later);

2. Unserviceable components which shall be maintained in accordance with this section (with Unserviceable Tag attached – Fig. 3-11)

3. Unsalvageable components which are classified in accordance with point 145.A.42(d).
## Figure 3-16. AVP Title page (sample)

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>TOTAL PAGES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**THE WORK RECORDED ABOVE HAS BEEN CARRIED OUT**

Certifying staff: 
(Signature, license No or stamp) / / (Date) (Time) 

Checked by Planning Unit: 
(Signature) / / (Date)
1.8 General description of the facilities at each address intended to be approved

This part presents all facilities in general location (office, shops, hangars, etc.) and description of all Line Stations and other particular locations used in Part-145 activities. Such descriptions are made as:

- Plans of offices, shops and hangars in use with numbering and descriptors proceeded by general description including address;
- Plans of airports showing the location of Line Station with plan(s) of its facilities.

1.9 Organisations Intended Scope of Work

The Part-145 approved maintenance organization issue CRS only for privileges as described in MOE. Example of Organizations Intended Scope of Work is shown in Fig. 3-33 and Fig. 3-34.

<table>
<thead>
<tr>
<th>Rating</th>
<th>TC Holder</th>
<th>Aircraft Model</th>
<th>Limitation</th>
<th>Maintenance Level</th>
<th>Line</th>
<th>Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Airbus</td>
<td>A318/A319</td>
<td>A318/A319A</td>
<td>Line and base maintenance up to and including SI (Structural Inspection), modifications and defect rectification, CFM 56 and IAE V2500 engines, Honeywell 131-9A and APIC APS3200 APU change and on-wing maintenance, excluding engine IAE V2500 borescope inspection</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A320/A321</td>
<td>A320/A321 (CFM 56)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Boeing Co</td>
<td>B737-300/400/500</td>
<td>B737-300/400/500 (CFM 56)</td>
<td>Line and base maintenance up to and including SI (Structural Inspection), modifications and defect rectification, CFM 56 and Garret GTCP85-129 series, GTCP36-260. Sunstrand APS2000 APU change and on-wing maintenance</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Figure 3-33. Example of Organization Intended Scope of Work
**Figure 3-34.** Example of Organization Intended Scope of Work (maintenance of components)

The exact information about components mentioned in **Fig. 3-34** presented through ATA chapters and name of manufacturer only, explicitly is given in Capability List (**Fig. 3-35**).

<table>
<thead>
<tr>
<th>Rating</th>
<th>ATA</th>
<th>Designation / Manufacturer</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>21</td>
<td>BOEING Co components</td>
<td></td>
</tr>
<tr>
<td>C5</td>
<td>24</td>
<td>SAFT components / VARTA components</td>
<td></td>
</tr>
<tr>
<td>C14</td>
<td>32</td>
<td>DUNLOP components / GOODRICH components / HONEYWELL components</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 3-35.** Example of Capability list (maintenance of components)

**MOE Part 2 Maintenance Procedures**

**2.5 Calibration of tools and equipment (Example)**

2.5.1. **Definition and Evolution of Inspection, Checking, Modification and Calibration Periodicities**

Tools, equipment and GSE department Manager will define the periodicities of the inspection, checking, modification and calibration based on:

- Original equipment manufacturers’ maintenance / calibration requirements, or
- The periodicities indicated in the attached tag/table in case of lack of information.
- For mechanical measurement equipment received new / since last calibration and being stored and not used the calibration due date will be defined as per ....
10.4 AIR OPERATIONS


This regulation was amended several times.

Regulation (EU) No 71/2014 amending Regulation (EU) No 965/2012 covers the requirements related to the Operational Suitability Data (OSD), thus closing the gap between aircraft design and operations. The OSD requirements mandate that aircraft manufacturers, including those building helicopters, submit data which EASA considers important for safe operation. OSD covers pilot training, maintenance staff and simulator qualification; the master minimum equipment list (MMEL); and possibly other areas, depending on the aircraft's systems.

Regulation (EU) No 800/2013 amending Regulation (EU) No 965/2012 covers non-commercial operations with aeroplanes, helicopters, balloons and sailplanes (Annex VI Part-NCC on complex motor-powered aircraft and Annex VII Part-NCO on other-than-complex motor-powered aircraft). It also includes the consequent changes to the previously published Annexes I to V.


Regulation (EU) No 379/2014 amending Regulation (EU) No 965/2012 completes the Air Operations regulatory package as Annex VIII Part-SPO. It includes the technical requirements for commercial specialised air operations with aeroplanes, helicopters, sailplanes and balloons and non-commercial specialised air operations with complex aeroplanes and complex helicopters. It also includes new provisions for CAT operations with balloons and sailplanes and CAT operations starting and ending at the same aerodrome with smaller aeroplanes/helicopters.


Commission Regulation (EU) 2016/1199 amending Regulation (EU) No 965/2012 as regards operational approval of performance-based navigation, certification and oversight of data services providers and helicopter offshore operations, and correcting that Regulation.
Figure 4-3. Applicability of Air Operations Regulation depending on the nature of flight

**Article 8 Flight time limitations**

*CAT operations with aeroplanes shall be subject to Subpart FTL of Annex III.*

**Air Operators Certificates**

*The air operator certificate (AOC) provides the basis for States to regulate the activities of operators and the means for the State to authorize an operator to commence air operations. The AOC, under control of issuing NAA, enables the NAA to exercise the continued safety oversight of operator.*

*The AOC certifies that the operator is authorized to perform commercial operations, as defined in the associate operations specifications, in accordance with the Air Operations Regulation.*

*The operation specifications associated with the AOC are an integral part of authorization under which an operator conducts air operations. The specifications cover all aspects of operation and include special limitations and authorizations with criteria as appropriate.*
Regulation (SC) No 1008/2008

of the European Parliament and of the Council of 24 September 2008 on common rules for the operation of air services in the Community (Recast), stressed the importance of air carrier financial issues.

According to this Regulation the Member-states issue operating licenses for all Community air carriers and carry out regular assessments of the air carriers' financial situation especially in the first two years of their existence as these are particularly critical for the survival of an air carrier on the market.

According to Regulations’ introductory part:

(6) To reduce risks to passengers, Community air carriers failing to fulfil the requirements for maintaining a valid operating licence should not be allowed to continue operations. In such cases, the competent licensing authority should revoke or suspend the operating licence.

(7) According to Regulation (EC) No 785/2004 of the European Parliament and of the Council of 21 April 2004 on insurance requirements for air carriers and aircraft operators (7) an air carrier should be insured to cover liability in case of accidents with respect to passengers, cargo and third parties.

Article 2 Definitions

For the purposes of this Regulation:

1. ‘operating licence’ means an authorisation granted by the competent licensing authority to an undertaking, permitting it to provide air services as stated in the operating licence;

3. ‘undertaking’ means any natural or legal person, whether profit-making or not, or any official body whether having its own legal personality or not;

Article 3 Operating licence

1. No undertaking established in the Community shall be permitted to carry by air passengers, mail and/or cargo for remuneration and/or hire unless it has been granted the appropriate operating licence.

Article 4 Conditions for granting an operating licence

An undertaking shall be granted an operating licence by the competent licensing authority of a Member State provided that:

(b) it holds a valid AOC issued by a national authority of the same Member State whose competent licensing authority is responsible for granting, refusing, revoking or suspending the operating licence of the Community air carrier;
**Part-ORO Organisation Requirements for Air Operations**

Part-ORO describes the requirements for the organizations intended to become (and to be) Air Operators.

**ORO.GEN.005 Scope**

This Annex establishes requirements to be followed by an air operator conducting:

(a) Commercial air transport operations (CAT);
(b) Commercial specialised operations;
(c) Non-commercial operations with complex motor-powered aircraft;
(d) Non-commercial specialised operations with complex motor-powered aircraft.

The structure of this Part is presented on Fig. 4-6.

![Structure of Annex III to Regulation 965/2012 (Part-ORO)](image)

**Figure 4-6. Structure of Annex III to Regulation 965/2012 (Part-ORO)**

**Subpart AOC Air Operator Certificate**

**ORO.AOC.100 Application for an air operator certificate**

(b) The operator shall provide the following information to the competent authority:

(1) The official name and business name, address, and mailing address of the applicant;
(2) A description of the proposed operation, including the type(s), and number of aircraft to be operated;
(3) A description of the management system, including organisational structure;
(4) The name of the accountable manager;
(5) The names of the nominated persons required by ORO.AOC.135(a) together with their qualifications and experience [persons responsible for the management and supervision of
**CDL Limitations**

No more than one part of one system may be missing except if otherwise specified. Parts of different systems may be simultaneously missing, unless otherwise specified in this list.

When missing part introduces additional limitation(s), this limitation is indicated in the dispatch condition of the item of this list. This limitation comes in addition to the ones of the LIMITATIONS chapter of AFM. This limitation must be clearly indicated by a placard on the pilot's instrument panel.

When an Master CDL dispatch condition refers to the MMEL, the minimum number of equipment required for dispatch is the most limiting of the two documents.

**CDL Usage**

The CDL as usual is divided according ATA chapters and consist of description as on Fig. 4-9 and illustration (Fig. 4-10).

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**Figure 4-9.** Description (example) of Air conditioning (ATA-21) system possible missing parts

The system performance after some parts are missing is described by „penalties“ diminishing the performance of total aircraft. Performance penalties are cumulative unless specific penalties for particular combinations of missing items are indicated.
These takeoff, en route and landing penalties apply to the most limiting corresponding weight. If performance penalties are not indicated for removed items, no more than three of such items can be missing without taking further penalty. If more than three of such items are missing together, the following performance penalties are applicable per additional missing item:

- Takeoff and approach climb performance limiting weights are reduced by 50 kg (110 lb);
- En route performance limiting weight is reduced by 60 kg (132 lb) (i.e. corresponding to a 60 ft decrease of en-route net ceiling).

**Figure 4-10. Illustration to description given on Fig. 4-9**

**MMEL / MEL Usage**

The important concept used in MMEL/MEL is the “calendar day”. A calendar day is a 24-hour period from midnight to midnight either in Coordinated Universal Time (UTC), or in local time, as decided by the Operator.
21.A.801 Identification of products

(a) The identification of products shall include the following information:

1. Manufacturer's name;
2. Product designation;
3. Manufacturer's Serial number;
4. Any other information the Agency finds appropriate.

(b) Any natural or legal person that manufactures an aircraft or engine under Subpart G or Subpart F shall identify that aircraft or engine by means of a fireproof plate that has the information specified in point (a) marked on it by etching, stamping, engraving, or other approved method of fireproof marking. The identification plate shall be secured in such a manner that it is accessible and legible, and will not likely be defaced or removed during normal service, or lost or destroyed in an accident.

(c) Any natural or legal person that manufactures a propeller, propeller blade, or propeller hub under Subpart G or Subpart F shall identify it by means of a plate, stamping, engraving, etching or other approved method of fireproof identification that is placed on it on a non-critical surface, contains the information specified in point (a), and will not likely be defaced or removed during normal service or lost or destroyed in an accident.

The aircraft identification plate is presente on Fig. 4-17.
10.5A CERTIFICATION OF AIRCRAFT, PARTS AND APPLIANCES

Any care of product reliability and liability starts from it design. Aircraft is not an exception. Its reliability and liability starts from clear rules and procedures used in design and production. More over when using complex products, their maintenance is very important to provide a long usability of product.

Aircrafts are products of high complexity and their long suitability for use in aviation transportation (airworthiness) is of great importance.

Commission Regulation (EU) No 748/2012

Commission Regulation (EU) No 748/2012 (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 organisations) emphasises important key points:

(3) It is necessary to lay down common technical requirements and administrative procedures to ensure the airworthiness and environmental compatibility of aeronautical products, parts and appliances...

(4) Organisations involved in the design and production of products, parts and appliances should be required to comply with certain technical requirements in order to demonstrate their capability and means to discharge their obligations and associated privileges...

(5) In laying down measures for the implementation of common essential requirements in the field of airworthiness ...

(6) The need to ensure uniformity in the application of common airworthiness and environmental requirements for aeronautical products, parts and appliances ...

(8) In order to maintain a high uniform level of aviation safety in Europe...

Article 1 Scope and definitions

1. This Regulation lays down, in accordance with Article 5(5) and Article 6(3) of Regulation (EC) No 216/2008 [this is the BR], common technical requirements and administrative procedures for the airworthiness and environmental certification of products, parts and appliances specifying:

(a) the issue of type-certificates, restricted type-certificates, supplemental type-certificates and changes to those certificates;

(b) the issue of certificates of airworthiness, restricted certificates of airworthiness, permits to fly and authorised release certificates;

(c) the issue of repair design approvals;

(d) the showing of compliance with environmental protection requirements;

(e) the issue of noise certificates;
The process of applying and issuance of Permit to fly is presented on Fig. 5-5 and the Permit to fly (EASA Form 20a) is presented on Fig. 5-6.

![Diagram](image)

**Figure 5-5.** The process of applying and issuance of Permit to fly

When approval of the flight conditions is related to the safety of the design, the flight conditions shall be approved by the Agency or an appropriately approved design organisation. When approval of the flight conditions is not related to the safety of the design, the flight conditions shall be approved by the competent authority, or the appropriately approved organisation that will also issue the permit to fly.

**21.A.723 Duration and continued validity**

(a) A permit to fly shall be issued for a maximum of 12 months and shall remain valid subject to:

1. compliance with the conditions and restrictions of point 21.A.711(e) associated with the permit to fly;
2. the permit to fly not being surrendered or revoked;
3. the aircraft remaining on the same register.

(b) Notwithstanding point (a), a permit to fly issued for the purpose of [For non-commercial flying activity on individual non-complex aircraft or types for which a certificate of airworthiness or restricted certificate of airworthiness is not appropriate] may be issued for unlimited duration.

(c) Upon surrender or revocation, the permit to fly shall be returned to the competent authority.
M.A.306 Aircraft technical log system

(a) For CAT, ... the operator shall use a technical log system containing the following information for each aircraft:

1. information about each flight ...
2. the current aircraft certificate of release to service, and;
3. the current maintenance statement giving the aircraft maintenance status of what scheduled and out of phase maintenance is next ...
4. all outstanding deferred defects rectifications ...
5. any necessary guidance instructions on maintenance support arrangements.

(b) The aircraft technical log system and any subsequent amendment shall be approved by the competent authority.

(c) An operator shall ensure that the aircraft technical log is retained for 36 months after the date of the last entry.

AMC M.A.306(b)
The aircraft technical log system can be either a paper or computer system or any combination of both methods acceptable to the competent authority.

In case of a computer system, it should contain programme safeguards against the ability of unauthorised personnel to alter the database.

The sample of Aircraft Technical Log pages is shown on Fig. 6-6.

Figure 6-6A. Aircraft Technical Log sample page
M.A.504 Control of unserviceable components

(a) A component shall be considered unserviceable in any one of the following circumstances:

1. expiry of the service life limit as defined in the maintenance program;
2. non-compliance with the applicable airworthiness directives and other continued airworthiness requirement mandated by the Agency;
3. absence of the necessary information to determine the airworthiness status or eligibility for installation;
4. evidence of defects or malfunctions;
5. involvement in an incident or accident likely to affect its serviceability.

As the requirements of points 1, 2 and 4, 5 are clear enough, the requirement of point 3 needs some explanation. The „necessary information“ may be EASA Form 1 (or equivalent) or another document as SERVICEABLE tag having clear origin.

(b) Unserviceable components shall be identified and stored in a secure location under the control of an approved maintenance organisation until a decision is made on the future status of such component.

The identification means each unserviceable component has „UNSERVISEABLE“ tag attached. The secure location is a separate store (storage room) clearly identified (e.g. by the plate „Unserviceable components. Authorized persons only“) or, if the amount of unserviceable components is insubstantial – separate shelve(s) identified by a plate „Unserviceable“.

(c) 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

AMC M.A.504(c)

1. The following types of components should typically be classified as unsalvageable:

(a) components with non-repairable defects, whether visible or not to the naked eye;
(b) components that do not meet design specifications, and cannot be brought into conformity with such specifications;
(c) components subjected to unacceptable modification or rework that is irreversible;
(d) certified life-limited parts that have reached or exceeded their certified life limits, or have missing or incomplete records;
5. no inconsistencies can be found between the aircraft and the point (a) documented review of records.

**AMC M.A.710(b) and (c)**

1. The physical survey could require actions categorised as maintenance (e.g. operational tests, tests of emergency equipment, visual inspections requiring panel opening etc.).

2. When the airworthiness review staff are not appropriately qualified to Part-66 in order to release such maintenance, M.A.710(b) requires them to be assisted by such qualified personnel. However, the function of such Part-66 personnel is limited to perform and release the maintenance actions requested ...

3. ... the airworthiness review staff who are going to sign the airworthiness review certificate ... should be the one performing both the documented review and the physical survey of the aircraft ...

Combining M.A.707 „Airworthiness review staff“, AMC M.A.707(a)1 and AMC M.A.710(b, c) to common picture, we have (Fig. 6-14):

![Figure 6-14. Preparation of Airworthiness Review](image)

**M.A.710(d) [Airworthiness Review anticipation]**

... the airworthiness review can be anticipated by a maximum period of 90 days without loss of continuity of the airworthiness review pattern, to allow the physical review to take place during a maintenance check.
10.7A APPLICABLE NATIONAL AND INTERNATIONAL REQUIREMENTS FOR (IF NOT SUPERSEDED BY EU REQUIREMENTS)

Maintenance Programs – Basic Terminology

In accordance with Delegation Agreement on the implementation of Article 83bis of Chicago Convention MP shall be approved by NAA of registration with approval of NAA of operator.

Usually there are three primary maintenance processes referred in MP:
- Hard time;
- On Condition;
- Condition Monitoring.

<table>
<thead>
<tr>
<th>Hard Time</th>
<th>A preventive maintenance process in which known deterioration of an item is limited to an acceptable level by the maintenance actions which are carried out at periods related to time in service. The prescribed maintenance practice normally include Servicing and such operations as Overhauls, Replacements, so that the item concerned is either replaced or restored to such a condition that it can be Released to Service for a further specified period</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Condition</td>
<td>A preventive maintenance process but one in which the item is inspected or tested, at specified periods, to an appropriate standard in order to determine whether it can continue in service. The main purpose of On-Condition is to remove an item before its failure in service. It is not philosophy of “fit until failure” or “fit and forget it”.</td>
</tr>
<tr>
<td>Condition Monitoring</td>
<td>Not a preventive maintenance process, having neither Hard Time nor On-Condition elements, but one in which information on items gained from operational experience is collected, analysed and interpreted on a continuing basis as a means of implementing corrective procedures</td>
</tr>
</tbody>
</table>

Some useful definitions concerning Maintenance Program are:

<table>
<thead>
<tr>
<th>Inspection</th>
<th>A visual check performed externally or internally in suitable lighting conditions from a distance considered necessary to detect unsatisfactory conditions / discrepancies using, where necessary, inspection aids such as mirrors, torches, magnifying glass etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional check</td>
<td>A detailed examination of a complete system, sub-system or component to determine if operating parameters are within limits of range of</td>
</tr>
</tbody>
</table>
Airworthiness Directive issuance and realization schematics is shown on Fig. 7-1.

**Figure 7-1.** Airworthiness Directive schematics

(d) An airworthiness directive shall contain at least the following information:

1. An identification of the unsafe condition;
2. An identification of the affected aircraft;
3. The action(s) required;
4. The compliance time for the required action(s);
5. The date of entry into force.

**Service Bulletins**

Modifications are printed by the manufacturer in the form a Service Bulletin (SB), Alert Service Bulletin (ASB) or Service Letters (SL). They can be classified as mandatory by the Authority in the form of AD. All the AD issued by Authority of aircraft registration and the Authority of state of design must be complied with.

**Figure 7-2.** Service information
(SARP) applies only to twins and defines ETOPS as "Extended-range Twin-engine Operational Performance Standards".

ETOPS applies to twins on routes with diversion time more than 60 minutes at one engine inoperative speed. For rules that also cover more than two engines, as in the case of the FAA, ETOPS applies on routes with diversion time more than 180 minutes for airplanes with more than two engines.

The difference between ETOPS and non-ETOPS flights may be shown as on Fig. 7-5.

**Figure 7-5.** The difference between ETOPS and non-ETOPS flights

The reason for earlier non-ETOPS flights was due to insufficient liability of former piston engine used in aviation. According to year 1953 ICAO report the probability of engine failure enlarges with engine horse power (Fig. 7-6).

**Figure 7-6.** Probability of piston engine failure