



GOVERNMENT OF INDIA  
**OFFICE OF THE DIRECTOR GENERAL OF CIVIL AVIATION**  
TECHNICAL CENTRE, OPP. SAFDARJUNG AIRPORT, NEW DELHI-110 003

**CIVIL AVIATION REQUIREMENTS**  
**SECTION 2 – AIRWORTHINESS**  
**SERIES ‘L’ PART X**  
**20<sup>th</sup> JANUARY, 1992**

**EFFECTIVE: FORTHWITH**

**Subject: Grant of approvals to persons engaged in overhaul, major repairs of components and accessories of aircraft, engines and their systems.**

**APPLICABILITY:** Aircraft Maintenance Organisations holding current approval granted in accordance with CAR 145.

**1. INTRODUCTION**

All work on aircraft as required by Rule 54 of the Aircraft Rules is to be certified by licensed engineers/ authorised or approved persons.

Sub-rule (7) of Rule 61 provides that the Central Government may grant approval to an applicant employed in an organisation approved by the Director General to issue a certificate of release to service in respect of an aircraft, engine, system component, instrument, accessory or item of equipment including radio equipment after inspection, maintenance, overhaul, repair, modification or test performed in accordance with the procedures approved by the Director General upon being satisfied that the applicant has sufficient knowledge, experience and has passed such examination as specified by Director-General.

This part of the CAR lays down the procedure for grant of approvals to persons engaged in overhaul, major repairs of aircraft, power plants, components and accessories of thereof.

## 2. DEFINITIONS

- 2.1 Certificate of Release to Service: A certificate issued in respect of an aircraft or aircraft system or component or equipment by appropriately licensed AME or authorised person, certifying that the same has been maintained, inspected and tested as per maintenance data and is airworthy in all respect and fit for release to service.

**Note 1:** Certificate of Release to service referred herein is synonymous to Certificate of Maintenance and Flight Release Certificate specified in Indian Aircraft Rules 1937 and in other Civil Aviation Requirements.

- 2.2 Approval : means approval granted by the Director General or approved organisation to persons who meet the specified requirements to carryout and certify overhaul, repair and modifications.
- 2.3 Basic Aircraft Maintenance Engineer's Licence (BAMEL) means a licence issued by the Director General without type rating to persons who have got basic aeronautical experience and have been examined by DGCA in accordance with the laid down Civil Airworthiness Requirements\* Series 'L' Part VIII.

## 3. REQUIREMENTS FOR GRANT OF APPROVAL

Applicants for grant of approval to carryout and certify overhaul, major repairs of aircraft, power plants, components and accessories thereof, shall meet the following requirements:

- 3.1 Age: 21 years.
- 3.2 Knowledge:
- 3.2.1 (a) Have Basic Aircraft Maintenance Licence or successfully completed an approved ab-initio course in aircraft maintenance engineering in appropriate category, or Diploma in Engineering in the appropriate branch.
- (b) Degree in Engineering in the appropriate branch.
- 3.2.2 Pass relevant modules (Annexure I) of examination conducted by DGCA.

Note 1: Depending on the scope of approval for which an application has been made, Examination modules that an applicant is required to have passed shall be determined by the Regional Airworthiness office in consultation with CEO.

Note 2: Applicants may be exempted from the modules of DGCA examination they have already passed.

3.3 Training:

The applicant must have undergone a training programme conducted by the manufacturer of the equipment or an organisation approved to impart such training or trained by a person having specific approval covering the activity for a period of 2 years.

3.4 Experience:

3.4.1 Applicants meeting the knowledge requirements of 3.2.1(a) & 3.2.1.(b) shall have two years additional experience in overhaul, major repairs, modifications of the system components and accessories, including six months recent experience.

3.4.2 Applicants seeking approval to carryout and certify structural repair/ modification should have minimum five years relevant field experience, and produce evidence that he has performed similar structural repairs at least twice under the supervision of an approved person in the preceding six months.

3.4.3 Applicants seeking extension to their scope of approval shall meet the following additional requirements.

3 months recent maintenance experience on the type of component / equipment if it falls in the same sub-group.

6 months recent maintenance experience on the type of component / equipment if it falls in the same group

24 months maintenance experience on the type of component / equipment if it falls in different group, out of which 6 months must be recent experience.

Example: Same sub-Group – Additional Hydro mechanical Components

Same Group – Mechanical components (Mechanical components to Hydro mechanical components)

Different Group – Mechanical components to Electrical components

3.5 The applicant should have been assessed medically fit by a registered medical practitioner to perform the scope of work applied for.

#### 4. GRANT OF APPROVAL

- 4.1.1 The application (Annexure II) must be forwarded to the Quality Manager by the Maintenance Manager of the organization / Chief Engineering Manager with a certificate confirming that the applicant meets all the requirements.
- 4.1.2 For issue/ extension of approvals, the applicant shall be subjected to a skill test by a board consisting of Quality Manager of the organisation and Head of the particular section/ shop. A representative of Director of Airworthiness of the concerned Region shall be associated with the board in case of first test of the applicant in that stream. On being satisfied that the applicant meets all the requirements of this CAR and has necessary skill to perform the work for which approval is sought, the board may formally recommend grant of approval.
- 4.1.3 The approval will be granted in the enclosed proforma (Annexure III). Initial issue of approval will bear the stamps of the Regional Airworthiness Office and Quality Manager of the approved organisation.

Note 1: Persons granted approval under this CAR shall not issue Certificate of release to service (CRS) for the component, unless authorized to do so under CAR 145.

Note 2: Modification/repair work carried out on the aircraft by personnel of Aircraft manufacturers of foreign country shall be governed by the regulations of respective National Aviation Authorities. However CRS shall be issued by personnel holding AME licence / Approval issued by DGCA / Approved Organisation prior to the release of the aircraft for operation.

Note 3: Organisations desirous of using the provisions of above policy shall detail their training programme, activities requiring approval, education, experience, on job training requirements and assessment procedure in their Maintenance Organisation Exposition.

#### 5. VALIDITY OF APPROVAL

- 5.1 The approval will be valid for a period of one year.
- 5.2 The approval may be renewed by the Manager (Quality) and forward a monthly statement of approvals so renewed to the Regional Airworthiness Office together with a certificate that the persons had six months working experience within the last 24 months and they continue to remain in the employment or employment contract of the organisation and have carried out the work within the scope of their approval.

5.3 The approvals will be renewed for a further period of one year provided the applicant has undergone refresher course once in the preceding 24 months and assessed medically fit.

## **6. SUSPENSIONS, CANCELLATION AND RETURN OF APPROVAL**

6.1 Approval will be withdrawn where an enquiry conducted by the approved organisation or the DGCA establishes that

- a) the holder of such approval has performed work or granted a certificate in respect of work which has not been performed in a careful and competent manner, or
- b) the holder of such approval has signed a certificate in respect of any matter which he is not authorised to deal with, or
- c) it is undesirable for any other reason that the holder of such approval should continue to exercise the functions of an approval holder.

6.2 The approval of a person withdrawn as a result of an enquiry shall not be restored without approval of the Regional Airworthiness Office. Such person shall also not be granted other approvals without the concurrence of the Regional Airworthiness Office.

6.3 All disciplinary actions taken against approved persons shall be immediately intimated to the Regional Airworthiness Office. Copies of warnings/memoranda issued to the approved persons shall also be forwarded to the Regional Airworthiness Office.

**NOTE:** Persons already holding approvals before 30th November, 2000 will continue to hold their approvals even if they are not meeting the requirement of this CAR. Such persons may also be granted additional approvals depending on induction of new aircraft type, aircraft components or systems, even when they migrate to other maintenance organisation.

Sd/--  
(R.P.SAHI)  
Joint Director General of Civil Aviation

**Annexure I**

**1. MATHEMATICS**

1.1 Arithmetic

1.2 Algebra

1.3 Geometry

**2. PHYSICS**

2.1 Matter

2.2 Mechanics

2.3 Thermodynamics

2.4 Optics (Light)

2.5 Wave Motion and Sound

**3. ELECTRICAL FUNDAMENTALS**

3.1 Electron Theory

3.2 Static Electricity and Conduction.

3.3 Electrical Terminology

3.4 Generation of Electricity

3.5 DC Sources of Electricity.

3.6 DC Circuits.

3.7 Resistance / Resistor.

3.8 Power

3.9 Capacitance / Capacitor

3.10 Magnetism.

3.11 Inductance / Inductor

3.12 DC Motor / Generator Theory

3.13 AC Theory

3.14 Resistive (R), Capacitive (C) and Inductive (L) Circuits.

3.15 Transformers.

3.16 Filters.

3.17 AC Generators.

3.18 AC Motors

**4. ELECTRONICS FUNDAMENTALS**

4.1 Semiconductors

4.2 Diodes

4.3 Transistors

4.4 Integrated Circuits.

4.5 Printed Circuit Boards.

4.6 Servomechanisms.

**5. DIGITAL TECHNIQUES ELECTRONIC INSTRUMENT SYSTEMS**

5.1 Electronic Instrument Systems

5.2 Numbering Systems

5.3 Data Conversion

5.4 Data Buses

5.5 Logic Circuits

5.6 Basic Computer Structure.

5.7 Microprocessors.

5.8 Integrated Circuits.

5.9 Multiplexing.

5.10 Fibre Optics.

5.11 Electronic Displays.

5.13 Software Management Control.

5.14 Electromagnetic Environment

5.15 Typical Electronic / Digital Aircraft  
Systems.

## **6. MATERIALS AND HARDWARE**

6.1 Aircraft Materials - Ferrous

6.2 Aircraft Materials - Non-Ferrous.

6.3 Aircraft Materials - Composite and  
Non-Metallic.

6.4 Corrosion.

6.5 Fasteners

6.6 Pipes and Unions.

6.7 Springs.

6.8 Bearings.

6.9 Transmissions.

6.10 Control Cables.

6.11 Electrical Cables and Connectors.  
Workshop Practices.

## **7. MAINTENANCE PRACTICES**

7.1 Safety Precautions – Aircraft and  
workshop

7.2 Workshop practices

7.3 Tools

7.4 Avionic General Test Equipment.

7.5 Engineering Drawings, Diagrams and  
Standards.

7.6 Fits and Clearances.

7.7 Electrical Cables and Connectors.  
Workshop Practices.

7.8 Riveting.

7.9 Pipes and Hoses.

7.10 Springs.

7.11 Bearings.

7.12 Transmissions.

7.13 Control Cables.

7.14 Material handling.

7.15 Welding, Brazing, Soldering and Bonding.

7.16 Aircraft Weight and Balance.

7.17 Aircraft Handling and Storage.

7.18 Disassembly, Inspection, Repair and  
Assembly Techniques.

7.19 Abnormal Events.

7.20 Maintenance Procedures.

## **8. BASIC AERODYNAMICS**

8.1 Physics of the Atmosphere.

8.2 Aerodynamics.

8.3 Theory of Flight.

8.4 Flight Stability and Dynamics.

## **9. HUMAN FACTORS**

9.1 General

9.2 Human performance and Limitations.

9.3 Social Psychology.

9.4 Factors Affecting Performance.

9.5 Physical Environment.

9.6 Tasks.

9.7 Communication.

11.13 Landing Gear (ATA 32)

9.8 Human Error.

11.14 Lights (ATA 33)

9.9 Hazards in the Workplace.

11.15 Oxygen (ATA 35)

## 10. AVIATION LEGISLATION

11.16 Pneumatic / Vacuum (ATA 36)

10.1 Regulatory Framework.

11.17 Water / Waste (ATA 38)

10.2 CAR 66 - Certifying Staff - Maintenance.

11.18 On Board Maintenance Systems (ATA 45)

10.3 CAR 145 - Approved Maintenance Organisations.

## 12. HELICOPTER AERODYNAMICS, STRUCTURES AND SYSTEMS

10.4 Commercial Air Transportation.

12.1 Theory of Flight - Rotary Wing Aerodynamics

10.5 Aircraft Certification.

12.2 Flight Control Systems

10.6 CAR-M.

12.3 Blade Tracking and Vibration Analysis

10.7 Defect Investigation and Reliability

12.4 Transmissions.

## 11. AEROPLANE AERODYNAMICS, STRUCTURES AND SYSTEMS

### 12.

12.5 Airframe Structures.

11.1 Theory of Flight.

12.5 Air Conditioning (ATA 21)

11.2 Airframe Structures - General Concepts.

12.6 Instruments / Avionic Systems

11.3 Airframe Structures - Aeroplanes.

12.7 Electrical Power (ATA 24)

11.4 Air Conditioning and Cabin pressurization (ATA 21)

12.8 Equipment and Furnishings (ATA 25)

11.5 Instruments / Avionic Systems.

12.9 Fire Protection (ATA 26)

11.6 Electrical Power (ATA 24)

12.10 Fuel Systems (ATA 28)

11.7 Equipment and Furnishings (ATA 25)

12.11 Hydraulic Power (ATA 29)

11.8 Fire Protection (ATA 26)

12.12 Ice and Rain protection (ATA 30)

11.9 Flight Controls (ATA 27)

12.13 Landing Gear (ATA 32)

11.10 Fuel Systems (ATA 28)

12.14 Lights (ATA 33)

11.11 Hydraulic Power (ATA 29)

12.15 Pneumatic / Vacuum (ATA 36)

11.12 Ice and Rain Protection (ATA 30)

**13. AIRCRAFT AERODYNAMICS,  
STRUCTURES AND SYSTEMS ( B2 )**

- 13.1 Theory of Flight
- 13.2 Structures - General Concepts.
- 13.3 Auto flight (ATA 22)
- 13.4 Communication / Navigation (ATA 23 / 24)
- 13.5 Electrical Power (ATA 24)
- 13.6 Equipment and Furnishings (ATA 25)
- 13.7 Flight Controls (ATA 27)
- 13.8 Instrument Systems (ATA 31)
- 13.9 Lights (ATA 33)
- 13.10 On board Maintenance Systems (ATA 45)

**14. PROPULSION**

- 14.1 Turbine Engines
- 14.2 Engine Indicating Systems

**15. GAS TURBINE ENGINE**

- 15.1 Fundamentals
- 15.2 Engine Performance
- 15.3 Inlet
- 15.4 Compressors
- 15.5 Combustion Section
- 15.5 Turbine Section
- 15.6 Exhaust
- 15.7 Bearings and Seals
- 15.8 Lubricants and Fuels.
- 15.9 Lubrication Systems.

- 15.10 Fuel Systems.
- 15.11 Air Systems
- 15.12 Starting and Ignition Systems.
- 15.13 Power Augmentation Systems.
- 15.14 Turbo-prop Engines.
- 15.15 Turbo-shaft engines
- 15.16 Auxiliary Power units (APU)
- 15.17 Power plant Installation.
- 15.18 Fire Protection Systems.
- 15.19 Engine Monitoring and Ground Operation.
- 15.20 Engine Storage and Preservation.

**16. PISTON ENGINE**

- 16.1 Fundamentals
- 16.2 Engine Performance.
- 16.3 Engine Construction.
- 16.4 Engine Fuel Systems.
- 16.5 Starting and Ignition Systems.
- 16.6 Induction, Exhaust and Cooling Systems.
- 16.7 Supercharging / Turbo charging.
- 16.8 Lubricants and Fuels.
- 16.9 Lubrication Systems
- 16.10 Engine Indication Systems
- 16.11 Power plant Installation
- 16.12 Engine monitoring and Ground Operation
- 16.13 Engine Storage and Preservation.

**17. PROPELLER**

17.1 Fundamentals

17.2 Propeller Construction

17.3 Propeller Pitch Control

17.4 Propeller Synchronizing

17.5 Propeller Ice Protection.

17.6 Propeller Maintenance

17.7 Propeller Storage and Preservation.

**18. Specific Component / equipment  
Maintenance Practices**

**19. Structural Repair Techniques**

DRAFT

ORGANISATION'S Name and address

**APPLICATION FOR ISSUE / EXTENSION / RENEWAL OF APPROVAL**

1. Name :
2. Date of birth :
3. Qualification :
4. Exam Modules Passed :
5. Basic training details :
6. Specific training details :
7. Refresher training details :
8. Date of last refresher training course :
9. General Experience details :
10. Experience related to the scope :
11. Recent experience details :
12. Scope of the approval held :
13. Validity of the approval :
14. Approval sought :

**DRAFT**

Date : signature of the applicant

Note: Evidence for qualification, experience, and training and on job training should be attached

---

Examination date:

Recommendation of the board with regard to the approval sought :

Member  
(shop)

Chairman  
Manager Responsible (Quality)

Member  
(DGCA)

**COMPANY'S NAME**

**CERTIFICATE OF APPROVAL**

**A.**

**APPROVAL NUMBER** \_\_\_\_\_

1. **NAME** \_\_\_\_\_

2. **ADDRESS** \_\_\_\_\_

\_\_\_\_\_

3. **NATIONALITY** \_\_\_\_\_

4. **DATE OF BIRTH** \_\_\_\_\_

5. **SIGNATURE OF HOLDER** \_\_\_\_\_

Issued in accordance with the provisions of the Indian Aircraft Act 1934 and Aircraft Rules 1937. Certified that the holder is authorised to exercise the privileges of the approval as given in Rule 61 of the Aircraft Rules 1937 and CAR Section 2 Series 'L' Part X / CAR 145 for the period specified herein.

**Signature of Issuing Officer:**

**Date and Stamp CAD**

**MANAGER ( QUALITY)**

B.

<b>Qualification</b>	
<b>Modules Passed</b>	

C.

<b>Scope of Approval</b>	<b>Signature with date</b>

DRAFT

**Limitations :**

**Privileges:**

1. Carryout and certify the scope of work endorsed on this approval card
2. Issue Certificate of Release to service

Note: Strikeout whichever is not applicable

FROM	TO	Signature with stamp & date

DRAFT

This approval is valid subjected to the following conditions:

1. The holder continues to be in the employment of the organization.
2. The holder meets the recent experience and refresher training requirement.
3. The holder is medically fit to exercise the privileges of the approval.
4. The work is carried out adopting good maintenance practice; in accordance with the recommendations of the manufacturer and requirements of DGCA
5. The work certified by the holder under this approval is authenticated with the approval number, stamp & date.
6. The signature and date is affixed without defacing the stamp.