


# CIVIL AVIATION REQUIREMENTS

# CAR 21

## CERTIFICATION PROCEDURES FOR AIRCRAFT AND RELATED PRODUCTS AND PARTS

ISSUE II (Revision 9)
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**Directorate General of Civil Aviation**

OFFICE OF THE DIRECTOR GENERAL OF CIVIL AVIATION
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# INTRODUCTION

Rule 50 of the Aircraft Rules, 1937 stipulates that there shall be a certificate of airworthiness for operation of aircraft in India. The prerequisite to this rule is to have a type certificate issued by DGCA in accordance with Rules 49, and 49A. With the objective of compliance with these rules, CAR 21 was drawn up based on the regulations of JAR 21, Amendment 4.

After this, EASA, Part 21 superseded JAR 21 and as a result, revision to CAR 21 was made taking into consideration of EASA, Part 21 basis.

CAR21 prescribes procedural requirements for issue of type certificates and changes to these certificates, issue of certificate of airworthiness, issue of noise certificate and issue of export airworthiness certificate. It covers matters related to design, manufacture and all other issues related to airworthiness including continued airworthiness, repairs, etc. CAR 21 also contains requirements for approval of design and production organisations as per the provisions of Rule 133B. The requirements for authorisation of aircraft components and items of equipment under the provisions of Rule 49H are also covered in this CAR.

This CAR is issued under the provisions of Rule 133A of the Aircraft Rules, 1937.

# RECORD OF REVISION

This CAR 21 is revised and re-issued on the 1st June 2008 and becomes effective forthwith. This record of revision is intended to be a summarized record of the major changes introduced when this CAR 21 was earlier amended.

Issue I: (Revision 0) 1st July2004

This CAR 21 has been issued containing regulations for certification of aircraft and related products and parts based on the regulations of JAR 21 Amendment 4.

Issue I: (Revision 1) 22nd February 2006

Subpart I (Noise Certificates) containing requirements on issue of Noise Certificates based on JAR 21 regulations has been included

Issue I: (Revision 2) 9th June 2006

The acceptable type certification basis and environmental protection requirements have been included and airworthiness codes were established.

Issue II: (Revision 0) 1st June 2008

To harmonize the national requirements with the international requirements, the existing regulations wherever appropriate, have been revised based on regulations of EASA Part 21 of EU Regulations.

Issue II: (Revision 1) 25th February 2010

The name of R&D Directorate has been changed to Aircraft Engineering Directorate. Consequent to this effect, necessary changes have been made in the regulation, AMC & GM and forms.

Issue II: (Revision 2) 28th September 2011

Consequent to changes/amendments that have taken place in EASA's Part 21 after enforcement of CAR 21, Issue – II, Rev 0, revision on CAR 21 is carried out taking into account of those amendments, where considered necessary. In addition, changes brought about in ICAO, Annex-8, Amendment 102 (excluding technical procedures) and requirements for SMS (for Design Organizations) are consolidated into this revision.

Issue II: (Revision 3) 24th April 2015

Consequent to changes/amendments that have taken place in EASA's Part 21 after 28.09.2011, the date of issue of CAR 21, Issue – II, Rev 2, revision on CAR 21 is carried out taking into account of those amendments, where considered necessary.

Issue II: (Revision 4) 22nd March 2017

Consequent to amendment 105-A in ICAO, Annex-8, revision in CAR 21 is carried out, where considered necessary. Editorial changes are also consolidated into this revision

Issue II: (Revision 5) 13th September, 2018

"Permit to Fly" is replaced with "Special Flight Permit" and "Restricted Certificate of Airworthiness" is replaced with "Special Certificate of Airworthiness". These changes are effected to keep it in line with the Aircraft Rules 1937 amended vide GSR No. 721(E) dated 23-06-2017. However, the procedural requirements contained in this/these subpart(s) remain unaffected. In addition to this, organisation approval validity and associated fees have been amended in view of the amended Aircraft Rules 1937 vide GSR No. 832(E) dated 30-06-2017 and GSR No. 66(E) dated 18.01.2017. Provision of suspension of type certificate is also included as per Amendment 106 to ICAO Annex 8. This revision also incorporates editorial changes where considered necessary.

Issue II: (Revision 6) 23rd November 2020

This revision includes the approach with regard to acceptance of certification documents/reports approved by military certification authority, requirements of Amendment 106 to ICAO Annex 8 and the activity related to prototype manufacturing/manufacturing of aircraft, engine and propeller and their related parts and appliances till the time Type certificate is not issued.

In addition, provision of Safety Management System has been done away with from Design organizations approved under Subpart JB

Issue II: (Revision 7) 4th August 2023

This revision provides amendment to subpart B, G and O to have more clarity with respect to the activity related to prototype manufacturing/manufacturing of aircraft, engine & propeller and their related parts & appliances till the time Type certificate is not issued.

Issue II: (Revision 8) 18th July 2025

This revision incorporates the provision for:

i. Issuing airworthiness codes by DGCA
ii. certification criteria for "VCA"

Issue II: (Revision 9) 27th October 2026

Editorial update to indicate the airworthiness requirements comprehensively by including Certification Specifications (CS) issued by EASA and Federal Aviation Regulations (FAR) prescribed by FAA in para 21.16A. Inclusion of Level III provision for audit findings for design organization and other editorial updates.

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FORM CA-2001-AED – DEFICIENCY REPORTING FORM 1

# LIST OF ACRONYMS

| | |
|---|---|
| AD | Airworthiness Directive |
| AED | Aircraft Engineering Directorate |
| APU | Auxiliary Power Unit |
| ATA | Air Transport Association |
| AMC | Acceptable Means of Compliance |
| AMM | Aircraft Maintenance Manual |
| BFE | Buyer Furnished Equipment |
| CAR | Civil Aviation Requirements |
| CS | Certification Specifications of EASA |
| CEMILAC | Centre for Military Airworthiness and Certification |
| DGCA | Directorate General of Civil aviation |
| DOA | Design Organization Approval |
| DOM | Design Organization Manual |
| DDP | Declaration of Design and Performance |
| DDA | Direct Delivery Authorization |
| FAR | Federal Aviation Regulations of USA |
| GM | Guidance Materials |
| HIRF | High Intensity Radiated Fields |
| ICA | Instructions for Continued Airworthiness |
| ILA | Issue of Letter of Agreement |
| IPC | Illustrated Parts Catalogue |
| ITSO | Indian Technical Standard Order |
| ITSOA | Indian Technical Standard Order Authorizations |
| IPA | Indian Parts Approval |
| LSA | Light Sport Aircraft |
| MTOP | Maximum Take Off Power |
| MTOM | Maximum Take Off Mass |
| NTO | No Technical Objection |
| POA | Production Organization Approval |
| POE | Production Organization Exposition |
| PSE | Principal Structural Element |
| RTC | Restricted Type Certificate |
| STC | Supplemental Type Certificate |
| SB | Service Bulletin |
| TC | Type Certificate |
| TCDS | Type Certificate Data Sheet |
| VLA | Very Light Aeroplanes |
| VLR | Very Light Rotorcraft |

**REQUIREMENTS FOR APPLICANTS AND ACQUIRED RIGHTS AND OBLIGATIONS**

# SUBPART A — GENERAL PROVISIONS

## 21.1 Scope and Definitions

### a) Scope

This Section establishes general provisions governing the rights and obligations of the applicant for, and holder of, any certificate issued or to be issued in accordance with CAR 21.

### b) Definitions

For the purposes of this CAR-21

(1) **"Airworthy"** *means the status of an aircraft, engine, propeller or part when it conforms to its approved design and is in a condition for safe operation.*

(2) **"Article"** *means any part and appliances to be used on civil aircraft.*

(3) **"Continuing airworthiness"** *means the set of processes by which an aircraft, engine, propeller or part complies with the applicable airworthiness requirements and remains in a condition for safe operation throughout its operating life.*

(4) **"Comply" and "compliance"** are used in connection with meeting a rule, regulation or requirement.

(5) **"Conform" and "conformity"** are used in connection with showing or finding a product, part or appliance is in accordance with an approved design.

(6) **"Critical engine(s)"***means any engine whose failure gives the most adverse effect on the aircraft characteristics relative to the case under consideration.*

*Note: On some aircraft there may be more than one equally critical engine. In this case, the expression "the critical engine" means one of those critical engines.*

(7) **"Demonstrate",** *unless otherwise stated, means demonstrate to DGCA.*

(8) **"Engine'** *means unit used or intended to be used for aircraft propulsion. It consists of at least those components and equipment necessary for functioning and control, but excludes the propeller/rotors (if applicable*).

(9) **"IPA"** *means Indian Parts Approval. The Indian Parts Approval means the article has been produced in accordance with approved design data not belonging to the type-certificate holder of the related product, except for ITSO articles.*

*(10)* **"ITSO"** *means Indian Technical Standard Order. The Indian Technical Standard Order is a detailed airworthiness specification issued by DGCA to ensure compliance with the requirements of this regulation as minimum performance standards for specified articles.*

*(11)* **"Import" and "Export"** *mean the transfer of products, parts and appliances between India and a foreign country.*

**(12)** **Mandatory Clauses -**

- *Use **"shall",** and are referred to as a "regulation", where they are an imperative (i.e. non-compliance could involve penalties).*
- *Use **"must",** and are referred to as a "requirement", where they are a condition precedent (i.e. non-compliance leads to failure to obtain a certificate or approval).*

*(13)* **"Parts and appliances"** *means any instrument, mechanism, equipment, part, apparatus, appurtenance, or accessory, including communications equipment, that is used in or intended to be used in operating or controlling an aircraft in flight and is installed in or attached to the aircraft. It includes parts of an airframe, engine or propeller.*

**Note:**

- *In CAR-21, the term "appliance" is not used alone; the term "part" when used alone carries its normal dictionary meaning.*
- *In Subpart O, parts and appliances subject to an ITSO Authorisation are referred to as "articles".*

*(14)* **"Person"** *is a legal entity, which is subject to the jurisdiction of India; it can include an Organization or Company.*

*(15)* **"Powerplant"** *means the system consisting of all the engines, drive system components (if applicable), and propellers (if installed), their accessories, ancillary parts, and fuel and oil systems installed on an aircraft but excluding the rotors for a helicopter.*

*(16)* ***"Product"*** *means an aircraft, aircraft engine, or propeller.*

(17) **"Principal place of business"** *means the head office or registered office of the undertaking within which he principal financial functions and operational control of the activities referred to this Regulation are exercised.*

(18) **"Safety Management System"** *means a systematic approach to managing safety, including necessary organizational structures, accountabilities, policies and procedures.*

*(19)* **"State Safety Programme"** *means an integrated set of regulations and activities aimed at improving safety.*

*(20)* **"VTOL-capable aircraft (VCA)"** *means a heavier-than-air aircraft, other than aeroplane or helicopter, capable of performing vertical take-off and landing by means of more than two lift/ thrust units that are used to provide lift during take-off and landing.*

**21.2 Undertaking by another person than the applicant for, or holder of, a certificate**

The actions and obligations required to be undertaken by the holder of, or applicant for, a certificate for a product, part or appliance under this Section may be undertaken on its behalf by any other natural or legal person, provided the holder of, or applicant for, that certificate can show that it has made an agreement with the other person such as to ensure that the holder's obligations are and will be properly discharged.

**21.3 A Failures, malfunctions and defects**

**(a) System for Collection, Investigation and Analysis of Data**:

The holder of a type-certificate, restricted type-certificate, supplemental type-certificate, Indian Technical Standard Order (ITSO) authorization, major repair design approval or any other relevant approval deemed to have been issued under this Regulation shall have a system for collecting, investigating and analyzing reports of and information related to failures, malfunctions, defects or other occurrences which cause or might cause adverse effects on the continuing airworthiness of the product, part or appliance covered by the type-certificate, restricted type-certificate, supplemental type-certificate, ITSO authorization, major repair design approval or any other relevant approval deemed to have been issued under this Regulation. Information about this system shall be made available to all known operators of the product, part or appliance and, on request, to any person authorized under other associated implementing Regulations.

**(b) Reporting to DGCA:**

1. The holder of a type-certificate, restricted type-certificate, supplemental type-certificate, ITSO authorization, major repair design approval or any other relevant approval deemed to have been issued under this Regulation shall report to DGCA any reportable failure, malfunction, defect or other occurrence of which it is aware related to a product, part, or appliance covered by the type-certificate, restricted type-certificate, supplemental type-certificate, ITSO authorization, major repair design approval or any other relevant approval deemed to have been issue under this Regulation, and which has resulted in or may result in an unsafe condition.

2. These reports shall be made in a form and manner established by DGCA, as soon as practicable and in any case dispatched not later than 72 hours after the identification of the possible unsafe condition, unless exceptional circumstances prevent this.

**(c) Investigation of Reported Occurrences**:

1. When an occurrence reported under paragraph (b), or under 21.129(f)(2) or 21.165(f)(2) results from a deficiency in the design, or a manufacturing deficiency, the holder of the type-certificate, restricted type-certificate, supplemental type-certificate, major repair design approval, ITSO authorization, or any other relevant approval deemed to have been issued under this Regulation, or the manufacturer as appropriate, shall investigate the reason for the deficiency and report to DGCA the results of its investigation and any action it is taking or proposes to take to correct that deficiency.

2. If DGCA finds that an action is required to correct the deficiency, the holder of the type-certificate, restricted type-certificate, supplemental type-certificate, major repair design approval, ITSO authorization, or any other relevant approval deemed to have been issued under this Regulation, or the manufacturer as appropriate, shall submit the relevant data to DGCA.

### 21.3 B Airworthiness directives

(a) An airworthiness directive means a document issued or adopted by DGCA which mandates actions to be performed on an aircraft to restore an acceptable level of safety, when evidence shows that the safety level of this aircraft may otherwise be compromised.

(b) DGCA shall issue an airworthiness directive when:

1. an unsafe condition has been determined by DGCA to exist in an aircraft, as a result of a deficiency in the aircraft, or an engine, propeller, part or appliance installed on this aircraft; and
2. that condition is likely to exist or develop in other aircraft.

(c) When an airworthiness directive has to be issued by DGCA to correct the unsafe condition referred to in paragraph (b), or to require the performance of an inspection, the holder of the type-certificate, restricted type-certificate, supplemental type-certificate, major repair design approval, ITSO authorization or any other relevant approval deemed to have been issued under this Regulation, shall:

1. Propose the appropriate corrective action or required inspections, or both, and submit details of these proposals to DGCA for approval.

2. Following the approval by DGCA of the proposals referred to under subparagraph (1), make available to all known operators or owners of the product, part or appliance and, on request, to any person required to comply with the airworthiness directive, appropriate descriptive data and accomplishment instructions.

(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.

(e) When distributing mandatory continuing airworthiness information, it shall be ensured that sensitive aviation security information is not transmitted to anyone other than to the appropriately authorized entity in a secured manner.

### 21.4 Coordination between design and production

Each holder of a type-certificate, restricted type-certificate, supplemental type-certificate, ITSO authorization, approval of a change to type design/type certificate or approval of a repair design, shall collaborate with the production organization as necessary to ensure:

(a) The satisfactory coordination of design and production required by21A.122, 21A.130(b)(3) and (4), 21A.133 and 21A.165(c)(2) and (3) as appropriate, and';

(b) The proper support of the continued airworthiness of the product, part or appliance.

Note: In case production organization is not company of India, then, there should be an agreement acceptable to DGCA India (as State of Design) and state of Manufacture that the manufacturing organization cooperates with the organization responsible for type design in assessing information on the design, manufacture and operation of the aircraft, engine or propeller.

# SUBPART B — TYPE-CERTIFICATES AND RESTRICTED TYPE-CERTIFICATES

**21.11 Scope**

This Subpart establishes the procedure for issuing type-certificates for products and restricted type-certificates for aircraft, and establishes the rights and obligations of the applicants for, and holders of, those certificates.

**21.13 Eligibility**

Any natural or legal person that has demonstrated, or is in the process of demonstrating, its capability in accordance with 21.14 shall be eligible as an applicant for a type-certificate or a restricted type-certificate under the conditions laid down in this Subpart.

**21.14 Demonstration of capability**

(a) Any organization applying for a type-certificate or restricted type-certificate shall demonstrate its capability by holding a design organization approval, issued by DGCA in accordance with Subpart JA.

(b) By way of derogation from paragraph (a), as an alternative procedure to demonstrate its capability, an applicant may seek DGCA agreement for the use of procedures setting out the specific design practices, resources and sequence of activities necessary to comply with this CAR, when the product is non powered sailplane.

**21.15 Application**

(a) An application for a type-certificate or restricted type-certificate shall be made in a form CA-30.

(b) An application for an aircraft type-certificate or restricted type-certificate shall be accompanied by a three-view of that aircraft and preliminary basic data, including the proposed operating characteristics and limitations.

(c) An application for an engine or propeller type-certificate shall be accompanied by a general arrangement drawing, a description of the design features, the operating characteristics, and the proposed operating limitations, of the engine, or propeller.

(d) An application for a type certificate or restricted type certificate shall be submitted to DGCA along with requisite fees as applicable.

**21.16 A Airworthiness codes**

(a) The applicable requirements for the issue of a Type Certificate for an aircraft, engine, or propeller are –

(1) The applicable airworthiness requirements as issued/specified by DGCA.

(2) The applicable airworthiness requirements that are as prescribed in

a) The Certification Specifications (CS) issued by the European Union Aviation Safety Agency (EASA), as applicable to the type of aeronautical product. These include CS-22 Sailplanes and Powered Sailplanes; CS-23 Normal, Utility, Aerobatic and Commuter Aeroplanes; CS-25 Large Aeroplanes; CS-27 Small Rotorcraft; CS-29 Large Rotorcraft; CS-31HB Hot Air Balloons; CS-34 Aircraft Engine Emissions and Fuel Venting; CS-36 Aircraft Noise; CS-E Engines; CS-P Propellers; CS-LSA Light Sport Aeroplanes; CS-VLA Very Light Aeroplanes; CS-VLR Very Light Rotorcraft.

or

b) The Title 14 Code of Federal Regulations (CFR) Parts of the Federal Aviation Administration (FAA) of USA, as applicable to the type of aeronautical product. These include FAA Title 14 Code of Federal Regulations (CFR) Part 23 - Airworthiness Standards: Normal Category Airplanes; Part 25 - Airworthiness Standards: Transport Category Airplanes; Part 27 - Airworthiness Standards: Normal Category Rotorcraft; Part 29 - Airworthiness Standards: Transport Category Rotorcraft; Part 31 - Airworthiness Standards: Manned Free Balloons; Part 33 - Airworthiness Standards: Aircraft Engines; Part 34 - Fuel Venting And Exhaust Emission Requirements for Turbine Engine Powered Airplanes; Part 35 - Airworthiness Standards: Propellers; Part 36 - Noise Standards: Aircraft Type And Airworthiness Certification

that are effective on the date of application for that certificate unless:-

(i) Otherwise accepted by DGCA; or

(ii) Compliance with later effective amendments is elected or required under this paragraph

(3) Any Special Conditions prescribed in accordance with CAR 21.16B.

**21.16 B Special conditions**

(a) DGCA shall prescribe special detailed technical specifications, named special conditions, for a product, if the related airworthiness code does not contain adequate or appropriate safety standards for the product, because:

1. The product has novel or unusual design features relative to the design practices on which the applicable airworthiness code is based; or
2. The intended use of the product is unconventional; or
3. Experience from other similar products in service or products having similar design features, has shown that unsafe conditions may develop.

(b) The special conditions contain such safety standards as DGCA finds necessary to establish a level of safety equivalent to that established in the applicable airworthiness code.

**21.17 Type-certification basis**

(a) The type-certification basis to be notified for the issuance of a type-certificate or a restricted type-certificate shall consist of:

1. The applicable airworthiness code established/prescribed by DGCA under CAR 21.16A that is effective on the date of application for that certificate unless:
   (i) Otherwise specified by DGCA; or
   (ii) Compliance with later effective amendments is elected by the applicant or required under paragraphs (c) and (d).
2. Any special condition prescribed in accordance with 21.16B (a).

(b) An application for type-certification of large aeroplanes and large rotorcraft shall be effective for five years and an application for any other type-certificate shall be effective for three years, unless an applicant shows at the time of application that its product requires a longer period of time for design, development, and testing, and DGCA approves a longer period.

(c) In the case where a type-certificate has not been issued, or it is clear that a type-certificate will not be issued, within the time limit established under paragraph (b); the applicant may:

1. File a new application for a type-certificate and comply with all the provisions of paragraph (a) applicable to an original application; or
2. File for an extension of the original application and comply with the applicable airworthiness codes that were effective on a date, to be selected by the applicant, not earlier than the date which precedes the date of issue of the type-certificate by the time limit established under paragraph (b) for the original application.

(d) If an applicant elects to comply with an amendment to the airworthiness codes that is effective after the filing of the application for a type-certificate, the applicant shall also comply with any other amendment that DGCA finds is directly related.

**21.18 Designation of applicable environmental protection requirements and airworthiness codes**

(a) The applicable noise requirements for the issue of a type-certificate for an aircraft are prescribed according to the provisions of Chapter 1 of Annex 16, Volume I, Part II to the Chicago Convention and:

1. for subsonic jet aeroplanes, in Volume I, Part II, Chapters 2, 3, 4 and 14, as applicable;
2. for propeller-driven aeroplanes, in Volume I, Part II, Chapters 3, 4, 5, 6 ,10 and 14, as applicable;
3. for helicopters, in Volume I, Part II, Chapters 8 and 11, as applicable; and
4. for supersonic aeroplanes, in Volume I, Part II, Chapter 12, as applicable.
5. for tilt-rotors, in Volume I, Part II, Chapter 13, as applicable.

(b) The applicable emission requirements for the issue of a type-certificate for an aircraft and engine are prescribed in Annex 16 to the Chicago Convention:

1. for prevention of intentional fuel venting, in Volume II, Part II, Chapter 2;

2. for emissions of turbo-jet and turbofan engines intended for propulsion only at subsonic speeds, in Volume II, Part III, Chapter 2; and
3. for emissions of turbo-jet and turbofan engines intended for propulsion only at supersonic speeds, in Volume II, Part III, Chapter 3.

### 21.19 Changes requiring a new type-certificate

Any natural or legal person proposing to change a product shall apply for a new type-certificate if DGCA finds that the change in design, power, thrust, or mass is so extensive that a substantially complete investigation of compliance with the applicable type-certification basis is required.

### 21.20 Compliance with the type-certification basis and environmental protection requirements

(a) The applicant for a type-certificate or a restricted type-certificate shall show compliance with the applicable type certification basis and environmental protection requirements and shall provide to DGCA the means by which such compliance has been shown.

(b) The applicant shall provide the DGCA with a certification programme detailing the means for compliance demonstration. This document shall be updated as necessary during the certification process.

(c) The applicant shall record justification of compliance within compliance documents according to the certification programme established under point (b).

(d) The applicant shall declare that it has shown compliance with all applicable type-certification basis and environmental protection requirements.

(e) Where the applicant holds an appropriate design organization approval, the declaration of paragraph (d) shall be made according to the provisions of Subpart JA.

(f) The compliance demonstrated during military certification by the applicant may be acceptable to DGCA if it is established that military certification basis/airworthiness requirements/specification followed during certification process are at least equal to or in exceedance with applicable DGCA certification basis/airworthiness requirements/specification.

### 21.21 Issue of a type-certificate

An applicant is entitled to a type certificate in the categories of very light, normal, utility, acrobatic, commuter, transport category aeroplane or very light, normal, transport category helicopter or balloon (manned free/ hot air) or LSA (meeting CS-LSA), or Sailplanes/ Powered Sailplanes or engines or propellers.

The applicant shall be entitled to have a product type-certificate issued by DGCA after:

(a) demonstrating its capability in accordance with 21.14;
(b) submitting the declaration referred to in 21.20(d); and
(c) it is shown that:
   1. The product to be certificated meets the applicable type-certification basis and environmental protection requirements designated in accordance with 21.17 and 21.18;
   2. Any airworthiness provisions not complied with are compensated for by factors that provide an equivalent level of safety;
   3. No feature or characteristic makes it unsafe for the uses for which certification is requested; and

4. The type-certificate applicant has expressly stated that it is prepared to comply with 21.44.

(d) In the case of an aircraft type-certificate, the engine or propeller, or both, if installed in the aircraft, have a type-certificate issued or determined in accordance with this Regulation.

**21.23 Issue of a restricted type-certificate**

(a) For an aircraft that does not fully meet the provisions of 21.21(c), the applicant shall be entitled to have a restricted type-certificate issued by DGCA under categories specified in 21.21after:

1. complying with the appropriate type-certification basis established by DGCA ensuring adequate safety with regard to the intended use of the aircraft, and with the applicable environmental protection requirements; expressly stating that it is prepared to comply with 21.44.

(b) The engine or propeller installed in the aircraft, or both, shall:

1. have a type-certificate issued or determined in accordance with this Regulation; or
2. have been shown to be in compliance with the airworthiness codes necessary to ensure safe flight of the aircraft.

**21.31 Type design**

(a) The type design shall consist of:

a) The drawings and specifications, and a listing of those drawings and specifications, necessary to define the configuration and the design features of the product shown to comply with the applicable type-certification basis and environmental protection requirements;
b) Information on materials and processes and on methods of manufacture and assembly of the product necessary to ensure the conformity of the product;
c) An approved airworthiness limitations section of the instructions for continued airworthiness as defined by the applicable airworthiness code; and
d) Any other data necessary to allow by comparison, the determination of the airworthiness, the characteristics of noise, fuel venting, and exhaust emissions (where applicable) of later products of the same type.

(b) Each type design shall be adequately identified.

**21.33 Investigation and tests**

(a) The applicant shall perform all inspections and tests necessary to show compliance with the applicable type-certification basis and environmental protection requirements by developing a prototype(s)/test platform(s)/test specimen(s).

(b) Development of Prototype(s)/test platform(s)/ test specimen(s) shall be consistent with the requirements specified either in Subpart F or as may be specified by DGCA, without any additional fees.

(c) Before each test required by paragraph (a) is undertaken, the applicant shall have determined:

**1.** For the prototype(s)/test platform(s)/test specimen(s):

(i) That materials and processes adequately conform to the specifications for the proposed type design;
(ii) That parts of the products adequately conform to the drawings in the proposed type design;
(iii) That the manufacturing processes, construction and assembly adequately conform to those specified in the proposed type design; and

2. That the test equipment and all measuring equipment used for tests are adequate for the test and are appropriately calibrated.

(d) The applicant shall allow DGCA to make any inspection necessary to check compliance with paragraph (b).

(e) The applicant shall allow DGCA to review any report and make any inspection and to perform or witness any flight and ground test necessary to check the validity of the declaration of compliance submitted by the applicant under 21.20(d) and to determine that no feature or characteristic makes the product unsafe for the uses for which certification is requested.

(f) For tests performed or witnessed by DGCA under paragraph (d):

1. The applicant shall submit to DGCA a statement of compliance with paragraph (b); and
2. No change relating to the test that would affect the statement of compliance may be made to a product, part or appliance between the stages at which compliance with paragraph (b) is shown and the stages at which it is presented to DGCA for test.

**21.35 Flight Tests**

(a) Flight testing for the purpose of obtaining a type-certificate shall be conducted in accordance with conditions for such flight testing specified by DGCA.

(b) The applicant shall make all flight tests that DGCA finds necessary:

1. To determine compliance with the applicable type-certification basis and environmental protection requirements, and
2. For aircraft to be certificated under this Section, except sailplanes and powered sailplanes to determine whether there is reasonable assurance that the aircraft, its parts and appliances are reliable and function properly.

(c) (Reserved)

(d) (Reserved)

(e) (Reserved)

(f) The flight tests prescribed in subparagraph (b)(2) shall include:

1. For aircraft incorporating turbine engines of a type not previously used in a type-certificated aircraft, at least 300 hours of operation with a full complement of engines that conform to a type-certificate; and
2. For all other aircraft, at least 150 hours of operation.

**21.41 Type-certificate**

The type-certificate and restricted type-certificate are both considered to include the type design, the operating limitations, the type-certificate data sheet for airworthiness and emissions, the applicable type-certification basis and environmental protection requirements with which DGCA records compliance, and any other conditions or limitations prescribed for the product in the applicable Airworthiness Codes and environmental protection requirements. The aircraft type-certificate and restricted type-certificate, in addition, both include the type-certificate data sheet for noise. The engine type-certificate data sheet includes the record of emission compliance.

**21.44 Obligations of the holder**

Each holder of a type-certificate or restricted type-certificate shall:

(a) undertake the obligations laid down in 21.3A, 21.3B, 21.4, 21.55, 21.57 and 21.61; and, for this purpose, shall continue to meet the qualification requirements for eligibility under 21.14; and

(b) specify the marking in accordance with Subpart Q.

**21.47 Transferability**

Transfer of a type-certificate or restricted type-certificate may only be made to a natural or legal person that is able to undertake the obligations under 21.44, and, for this purpose, has demonstrated its ability to qualify under the criteria of 21.14.

**21.51 Duration and continued validity**

(a) A type-certificate and restricted type-certificate shall be issued for an unlimited duration. They shall remain valid subject to:

1. The holder remaining in compliance with CAR 21; and
2. The certificate not being surrendered, suspended or revoked under the applicable administrative procedures established by DGCA.

(b) Upon surrender or revocation, the type-certificate and restricted type-certificate shall be returned to DGCA.

**21.55 Record keeping**

All relevant design information, drawings and test reports, including inspection records for the product tested, shall be held by the type-certificate or restricted type-certificate holder at the disposal of DGCA and shall be retained in order to provide the information necessary to ensure the continued airworthiness and compliance with applicable environmental protection requirements of the product.

**21.57 Manuals**

The holder of a type-certificate or restricted type-certificate shall produce, maintain and update master copies of all manuals required by the applicable type-certification basis and environmental protection requirements for the product, and provide copies, on request, to DGCA.

**21.61 Instructions for continued airworthiness**

(a) The holder of the type-certificate or restricted type-certificate shall furnish at least one set of complete instructions for continued airworthiness, comprising descriptive data and accomplishment instructions prepared in accordance with the applicable type-certification basis, to each known owner of one or more aircraft, engine or propeller upon its delivery or upon issue of the first certificate of airworthiness for the affected aircraft, whichever occurs later and thereafter make those instructions available on request to any other person required to comply with any of the terms of those instructions. The availability of some manual or portion of the instructions for continued airworthiness, dealing with overhaul or other forms of heavy maintenance, may be delayed until after the product has entered into service, but shall be available before any of the products reaches the relevant age or flight-hours/cycles.

(b) In addition, changes to the instructions for continued airworthiness shall be made available to all known operators of the product and shall be made available on request to any person required to comply with any of those instructions. A programme showing how changes to the instructions for continued airworthiness are distributed shall be submitted to DGCA.

(c) When Indian authorities approve the modification on a product, which has been designed in any other State, DGCA shall transmit the mandatory continuing airworthiness information to all States that have the modified aircraft on their registries.

(d) When distributing mandatory continuing airworthiness information, it shall be ensured that sensitive aviation security information is not transmitted to anyone other than to the appropriately authorized entity in a secured manner.

# SUBPART C — NOT APPLICABLE

# SUBPART D — CHANGES TO TYPE-CERTIFICATES AND RESTRICTED TYPE-CERTIFICATES

**21.90 Scope**

This Subpart establishes the procedure for the approval of changes to type designs/type certificates, and establishes the rights and obligations of the applicants for, and holders of, those approvals. In this Subpart, references to type-certificates include type-certificate and restricted type-certificate.

**21.91 Classification of changes in type design**

Changes in type design are classified as minor and major. A 'minor change' is one that has no appreciable effect on the mass, balance, structural strength, reliability, operational characteristics, noise, fuel venting, exhaust emission, or other characteristics affecting the airworthiness of the product. Without prejudice to 21.19, all other changes are 'major changes' under this Subpart. Major and minor changes shall be approved in accordance with 21.95 or 21.97 as appropriate, and shall be adequately identified.

**21.92 Eligibility**

(a) Only the type-certificate holder may apply for approval of a major change to a type design/ type certificate under this Subpart; all other applicants for a major change to a type design shall apply under Subpart E.

(b) Any natural or legal person may apply for approval of a minor change to a type design/ type certificate under this Subpart.

**21.93 Application**

An application for approval of a change to a type design/ type certificate shall be made in form CA-31/CA-32 and shall include:

(a) A description of the change identifying

1. All parts of the type design and the approved manuals affected by the change; and
2. The airworthiness codes and environmental protection requirements with which the change has been designed to comply in accordance with 21.101.

(b) Identification of any re-investigations necessary to show compliance of the changed product with the applicable airworthiness codes and environmental protection requirements.

(c) An application for approval of a change to a type design shall be submitted to DGCA along with requisite fees as applicable.

**21.95 Minor changes**

Minor changes in a type design/ type certificate shall be classified and approved either:

(a) By DGCA; or

(b) By an appropriately approved design organization under a procedure agreed with DGCA.

**21.97 Major changes**

(a) An applicant for approval of a major change shall:

1. submit to DGCA substantiating data together with any necessary descriptive data for inclusion in the type design;
2. show that the changed product complies with applicable certification specifications/airworthiness regulations and environmental protection requirements, as specified in 21.101;
3. comply with para 21.20(b), (c) and (d);
4. where the applicant holds an appropriate design organization approval, make the declaration referred to in para 21.20(d) according to the provisions of Subpart JA;
5. comply with 21.33 and, where applicable, 21.35.

(b) Approval of a major change in a type design/ type certificate is limited to that or those specific configuration(s) in the type design upon which the change is made.

**21.101 Designation of applicable airworthiness codes and environmental protection requirements**

(a) An applicant for a change to a type-certificate shall demonstrate that the changed product complies with the airworthiness code that is applicable to the changed product and that is in effect at the date of the application for the change, and with the applicable environmental protection requirements laid down in 21.18.

(b) By derogation from paragraph (a), an applicant may show that the changed product complies with an earlier amendment of the airworthiness code defined in paragraph (a), and of any other airworthiness codes DGCA finds is directly related. However, the earlier amended airworthiness code may not precede the corresponding airworthiness code incorporated by reference in the type-certificate. The applicant may show compliance with an earlier amendment of an airworthiness code for any of the following:

1. A change that DGCA finds not to be significant. In determining whether a specific change is significant, the DGCA considers the change in context with all previous relevant design changes and all related revisions to the applicable airworthiness codes incorporated in the type certificate for the product. Changes that meet one of the following criteria are automatically considered significant:

(i) The general configuration or the principles of construction are not retained.

(ii) The assumptions used for certification of the product to be changed do not remain valid.

2. Each area, system, part or appliance that DGCA finds is not affected by the change.
3. Each area, system, part or appliance that is affected by the change, for which DGCA finds that compliance with an airworthiness code described in paragraph (a) would not contribute materially to the level of safety of the changed product or would be impractical.

(c) An applicant for a change to an aircraft (other than a rotorcraft) of 2 722 kg (6 000 lbs.) or less maximum weight or to a non-turbine rotorcraft of 1 361 kg (3 000 lbs.) or less maximum weight may show that the changed product complies with the type-certification basis incorporated by reference in the type-certificate. However, if DGCA finds that the change is significant in an area, DGCA may designate compliance with an amendment to the type-certification basis incorporated by reference in the type-certificate, in effect at the date of the application, and any airworthiness code that DGCA finds is directly related, unless DGCA also finds that compliance with that amendment or airworthiness codes would not contribute materially to the level of safety of the changed product or would be impractical.

(d) If the DGCA finds that the airworthiness code in effect at the date of the application for the change does not provide adequate standards with respect to the proposed change, the applicant shall also comply with any special conditions, and amendments to those special conditions, prescribed under the provisions of 21.16B, to provide a level of safety equivalent to that established in the airworthiness code in effect at the date of the application for the change.

(e) An application for a change to a type-certificate for large aeroplanes and large rotorcraft is effective for five years, and an application for a change to any other type-certificate is effective for three years. In a case where the change has not been approved, or it is clear that it will not be approved under the time limit established under this sub Paragraph, the applicant may:

1. file a new application for a change to the type-certificate and comply with all the provisions of paragraph (a) applicable to an original application for a change; or
2. file for an extension of the original application and comply with the provisions of paragraph (a) for an effective date of application, to be selected by the applicant, not earlier than the date which precedes the date of approval of the change by the time period established under this subparagraph for the original application for the change.

(f) If an applicant chooses to comply with an airworthiness codes or an amendment to the airworthiness codes that is effective after the filing of the application for a change to a type, the applicant shall also comply with any other airworthiness codes that the DGCA finds is directly related.

(g) The compliance demonstrated during military certification by the applicant may be acceptable to DGCA if it is established that military certification basis/airworthiness requirements/specification followed during certification process are at least equal to or in exceedance with applicable DGCA certification basis/airworthiness requirements/specification.

**21.103 Issue of approval**

(a) The applicant shall be entitled to have a major change to a type design/type certificate approved by DGCA after:

1. submitting the declaration referred to in 21.97(a)(3); and
2. It is shown that:

(i) The changed product meets the applicable airworthiness codes and environmental protection requirements, as specified in 21.101;
(ii) Any airworthiness provisions not complied with are compensated for by factors that provide an equivalent level of safety; and
(iii) No feature or characteristic makes the product unsafe for the uses for which certification is requested.

(b) A minor change to a type design/type certificate shall only be approved in accordance with 21.95 if it is shown that the changed product meets the applicable airworthiness codes, as specified in 21.101.

**21.105 Record keeping**

For each change, all relevant design information, drawings and test reports, including inspection records for the changed product tested, shall be held by the applicant at the disposal of DGCA and shall be retained in order to provide the information necessary to ensure the continued airworthiness and compliance with applicable environmental protection requirements of the changed product.

**21.107 Instructions for continued airworthiness**

(a) The holder of a minor change approval to type design/type certificate shall furnish at least one set of the associated variations, if any, to the instructions for continued airworthiness of the product on which the minor change is to be installed, prepared in accordance with the applicable type-certification basis, to each known owner of one or more aircraft, engine, or propeller incorporating the minor change, upon its delivery, or upon issuance of the first certificate of airworthiness for the affected aircraft, whichever occurs later, and thereafter make those variations in instructions available, on request, to any other person required to comply with any of the terms of those instructions.

(b) In addition, changes to those variations of the instructions for continued airworthiness shall be made available to all known operators of a product incorporating the minor change and shall be made available, on request, to any person required to comply with any of those instructions.

(c) When Indian authorities approve the modification on a product, which has been designed in any other State, DGCA shall transmit the mandatory continuing airworthiness information to all States that have the modified aircraft on their registries.

(d) When distributing mandatory continuing airworthiness information, it shall be ensured that sensitive aviation security information is not transmitted to anyone other than to the appropriately authorized entity in a secured manner.

**21.109 Obligations**

The holder of a minor change approval to type design/type certificate shall:

(a) undertake the obligations laid down in 21.4, 21.105 and 21.107; and
(b) specify the marking, in accordance with 21.804(a).

# SUBPART E — SUPPLEMENTAL TYPE-CERTIFICATES

**21.111 Scope**

This Subpart establishes the procedure for the approval of major changes to the type design/type certificate under supplemental type certificate procedures, and establishes the rights and obligations of the applicants for, and holders of, those certificates.

**21.112 A Eligibility**

Any natural or legal person ('organization') that has demonstrated, or is in the process of demonstrating, its capability under 21.112B shall be eligible as an applicant for a supplemental type-certificate under the conditions laid down in this Subpart.

**21.112 B Demonstration of capability**

(a) Any organization applying for a supplemental type-certificate shall demonstrate its capability by holding a design organization approval, issued by DGCA in accordance with Subpart JA.

(b) By way of derogation from paragraph (a), as an alternative procedure to demonstrate its capability, an applicant may seek DGCA agreement for the use of procedures setting out the specific design practices, resources and sequence of activities necessary to comply with this Subpart.

**21.113 Application for a supplemental type-certificate**

(a) An application for a supplemental type-certificate shall be made in form CA-33.

(b) An application for a supplemental type-certificate shall include the descriptions and identification required by 21.93. In addition, such an application shall include a justification that the information on which those identifications are based is adequate either from the applicant's own resources, or through an arrangement with the type-certificate holder.

(c) An application for a supplemental type-certificate shall be submitted to DGCA along with requisite fees as applicable.

**21.114 Showing of compliance**

Any applicant for a supplemental type-certificate shall comply with 21.97.

In case of military certification approved certification data, applicant shall comply with 21.20 (f) & 21.101 (g)

**21.115 Issue of a supplemental type-certificate**

The applicant shall be entitled to have a supplemental type-certificate issued by DGCA after:

(a) complying with 21.103(a);
(b) demonstrating its capability in accordance with 21.112B;

(c) where, under 21.113(b), the applicant has entered into an arrangement with the type-certificate holder,

1. The type-certificate holder has advised that it has no technical objection to the information submitted under 21.93; and
2. The type-certificate holder has agreed to collaborate with the supplemental type-certificate holder to ensure discharge of all obligations for continued airworthiness of the changed product through compliance with 21.44 and 21.118A.

**21.116 Transferability**

A supplemental type-certificate shall only be transferred to a natural or legal person that is able to undertake the obligations of 21.118A and for this purpose has demonstrated its ability to qualify under the criteria of 21.112B.

**21.117 Changes to that part of a product covered by a supplemental type-certificate**

(a) Minor changes to that part of a product covered by a supplemental type-certificate shall be classified and approved in accordance with Subpart D.

(b) Each major change to that part of a product covered by a supplemental type-certificate shall be approved as a separate supplemental type-certificate in accordance with this Subpart.

(c) By way of derogation from paragraph (b), a major change to that part of a product covered by a supplemental type-certificate submitted by the supplemental type-certificate holder itself may be approved as a change to the existing supplemental type-certificate.

**21.118 A Obligations**

Each holder of a supplemental type-certificate shall:

(a) undertake the obligations:

1. Laid down in 21.3A, 21.3B, 21.4, 21.105, 21.119 and 21.120;
2. Implicit in the collaboration with the type-certificate holder under 21.115(c)(2); and for this purpose continue to meet the criteria of 21.112B

(b) specify the marking, in accordance with 21.804(a).

**21.118 B Duration and continued validity**

(a) A supplemental type-certificate shall be issued for an unlimited duration. It shall remain valid subject to:

1. the holder remaining in compliance with this CAR; and
2. the certificate not being surrendered, suspended or revoked under the applicable administrative procedures established by DGCA.

(b) Upon surrender or revocation, the supplemental type-certificate shall be returned to DGCA.

**21.119 Manuals**

The holder of a supplemental type-certificate shall produce, maintain, and update master copies of variations in the manuals required by the applicable type-certification basis and environmental protection requirements for the product, necessary to cover the changes introduced under the supplemental type-certificate, and furnish copies of these manuals to DGCA on request.

**21.120 Instructions for continued airworthiness**

(a) The holder of the supplemental type-certificate for an aircraft, engine, or propeller, shall furnish at least one set of the associated variations to the instructions for continued airworthiness, prepared in accordance with the applicable type-certification basis, to each known owner of one or more aircraft, engine, or propeller incorporating the features of the supplemental type-certificate, upon its delivery, or upon issuance of the first certificate of airworthiness for the affected aircraft, whichever occurs later, and thereafter make those variations in instructions available, on request, to any other person required to comply with any of the terms of those instructions. Availability of some manual or portion of the variations to the instructions for continued airworthiness, dealing with overhaul or other forms of heavy maintenance, may be delayed until after the product has entered into service, but shall be available before any of the products reaches the relevant age or flight-hours/cycles.

(b) In addition, changes to those variations of the instructions for continued airworthiness shall be made available to all known operators of a product incorporating the supplemental type-certificate and shall be made available, on request, to any person required to comply with any of those instructions. A programme showing how changes to the variations to the instructions for continued airworthiness are distributed shall be submitted to DGCA.

(c) When Indian authorities approve the modification on a product, which has been designed in any other State, DGCA shall transmit the mandatory continuing airworthiness information to all States that have the modified aircraft on their registries.

(d) When distributing mandatory continuing airworthiness information, it shall be ensured that sensitive aviation security information is not transmitted to anyone other than to the appropriately authorized entity in a secured manner.

# SUBPART F — PRODUCTION WITHOUT PRODUCTION ORGANISATION APPROVAL

**21.121 Scope**

(a) This Subpart establishes the procedure for demonstrating the conformity with the applicable design data of a product, part and appliance that is intended to be manufactured without a production organization approval under Subpart G.

(b) This Subpart establishes the rules governing the obligations of the manufacturer of a product, part, or appliance being manufactured under this Subpart.

**21.122 Eligibility**

Any natural or legal person may apply to show conformity of individual products, parts or appliances under this Subpart, if;

(a) it holds or has applied for an approval covering the design of that product, part or appliance, or

(b) it has ensured satisfactory coordination between production and design, through an appropriate arrangement with the applicant for, or holder of, an approval of such a design.

**21.124 Application**

(a) Each application for an agreement to the showing of conformity of individual products, parts and appliances under this Subpart shall be made along with requisite fees as applicable in a form and manner established by the DGCA.

(b) Such application shall contain:

1. evidence which demonstrate, where applicable, that:

   (i) the issuance of a production organization approval under Subpart G would be inappropriate; or

   (ii) the certification or approval of a product, part or appliance under this Subpart is needed pending the issuance of a production organization approval under Subpart G.

2. An outline of the information required by 21.125A (b).

**21.125A Issue of a letter of agreement**

The applicant shall be entitled to have a letter of agreement issued by DGCA agreeing to the showing of conformity of individual products, parts and appliances under this Subpart, after:

(a) having established a production inspection system that ensures that each product, part or appliance conforms to applicable design data and is in condition for safe operation;

(b) providing a manual that contains:

1. a description of the production inspection system required under point (a),
2. a description of the means for making the determinations of the production inspection system,
3. a description of the tests required in points 21.127 and 21.128, and the names of persons authorized for the purpose of 21.130(a),
4. description of independent monitoring function,

(c) demonstrating that it is able to provide assistance in accordance with 21.3A and 21.129(d).

(d) the approval of an authorized signatory by DGCA to validate the Statement of Conformity (Form CA-52)/ Authorized release certificate (Form CA-1).

**21.125B Findings**

(a) When objective evidence is found showing non-compliance of the holder of a letter of agreement with the applicable requirements of this CAR, the finding shall be classified as follows:
1. A level one finding is any non-compliance with this CAR which could lead to uncontrolled non-compliances with applicable design data and which could affect the safety of the aircraft.
2. A level two finding is any non-compliance with this CAR which is not classified as level one.

(b) A level three finding is any item where it has been identified, by objective evidence, to contain potential problems that could lead to non-compliance under paragraph (a).

(c) After receipt of notification of findings.
1. In case of a level one finding, the holder of the letter of agreement shall demonstrate corrective action to the satisfaction of DGCA within a period of 7 working days, extendable up to maximum 21 working days, depending upon the complexity of the case after written confirmation of the finding;
2. In case of level two findings, the corrective action period granted by DGCA shall be within one month. In certain circumstances and subject to the nature of the finding, DGCA may extend the period from one month to 45 days subject to a satisfactory corrective action plan agreed by the DGCA.
3. A level three finding shall not require immediate action by the holder of the letter of agreement.

(d) In case of level one or level two findings, the letter of agreement may be subject to a partial or full limitation, suspension and revocation. The holder of the letter of agreement shall provide confirmation of receipt of the notice of limitation, suspension or revocation of the letter of agreement in a timely manner.

**21.125C Duration and continued validity**

(a) The letter of agreement shall be issued for a limited duration not exceeding one year. It shall remain valid unless:
1. The holder of the letter of agreement fails to demonstrate compliance with the applicable requirements of this Subpart; or
2. There is evidence that the manufacturer cannot maintain satisfactory control of the manufacture of products, parts, or appliances under the agreement; or
3. The manufacturer no longer meets the requirements of 21.122; or
4. The letter of agreement has been surrendered, revoked or has expired.

(b) Upon surrender, revocation or expiry, the letter of agreement shall be returned to DGCA.

**21.126A Production inspection system**

(a) The production inspection system required under 21.125A (a) shall provide a means for determining that:
1. Incoming materials, and bought or subcontracted parts, used in the finished product are as specified in the applicable design data.
2. Incoming materials, and bought or subcontracted parts, are properly identified.
3. Processes, manufacturing techniques and methods of assembly affecting the quality and safety of the finished product are accomplished in accordance with specifications accepted by the DGCA.
4. Design changes, including material substitutions, have been approved under Subpart D or E and controlled before being incorporated in the finished product.

(b) The production inspection system required by 21.125A (a), shall also be such as to ensure that:
1. Parts in process are inspected for conformity with the applicable design data at points in production where accurate determinations can be made.
2. Materials subject to damage and deterioration are suitably stored and adequately protected.
3. Current design drawings are readily available to manufacturing and inspection personnel, and used when necessary.
4. Rejected materials and parts are segregated and identified in a manner that precludes installation in the finished product.
5. Materials and parts that are withheld because of departures from design data or specifications, and that are to be considered for installation in the finished product, are subjected to an approved engineering and manufacturing review procedure. Those materials and parts determined by this procedure to be serviceable shall be properly identified and re-inspected if rework or repair is necessary. Materials and parts rejected by this procedure shall be marked and disposed of to ensure that they are not incorporated in the final product.
6. Records produced under the production inspection system are maintained, identified with the completed product or part where practicable, and retained by the manufacturer in order to provide the information necessary to ensure the continued airworthiness of the product.

**21.126B Quality assurance system and Independent monitoring function.**

The production inspection system shall contain an independent quality monitoring function to monitor compliance with, and adequacy of, the documented procedures of the production inspection system. This monitoring shall include a feedback system to the person or group of persons who have been nominated by the production organization to ensure that the organization is in compliance with the requirements of this part to ensure, as necessary, corrective action.

**21.126C Safety Management System (SMS)**

Organization carrying out production without production organization approval shall have a safety management system in accordance with CAR Section 1 Series C Part 1.

**21.126 D Investigation**

A production organization shall make arrangements that allow DGCA to make any investigations, including investigations of partners and subcontractors, necessary to determine compliance and continued compliance with the applicable requirements of this Subpart.

**21.127 Tests: aircraft**

(a) Each manufacturer of an aircraft manufactured under this Subpart shall establish an approved production ground and flight test procedure and check-off forms, and in accordance with those forms, test each aircraft produced, as a means of establishing relevant aspects of compliance with 21.125A(a).

(b) Each production test procedure shall include at least the following:

1. A check on handling qualities;
2. A check on flight performance (using normal aircraft instrumentation);
3. A check on the proper functioning of all aircraft equipment and systems;
4. A determination that all instruments are properly marked, and that all placards and required flight manuals are installed after flight test;
5. A check of the operational characteristics of the aircraft on the ground;
6. A check on any other items peculiar to the aircraft being tested.

**21.128 Tests: engines and propellers**

Each manufacturer of engines, or propellers manufactured under this Subpart shall subject each engine, or variable pitch propeller, to an acceptable functional test as specified in the type-certificate holder's documentation, to determine if it operates properly throughout the range of operation for which it is type-certificated, as a means of establishing relevant aspects of compliance with 21.125A(a).

### 21.129 Obligations of the manufacturer

Each manufacturer of a product, part or appliance being manufactured under this Subpart shall:

(a) Make each product, part or appliance available for inspection by DGCA.

(b) Maintain at the place of manufacture the technical data and drawings necessary to determine whether the product conforms to the applicable design data.

(c) Maintain the production inspection system that ensures that each product conforms to the applicable design data and is in condition for safe operation

(d) Provide assistance to the holder of the type-certificate, restricted type-certificate or design approval in dealing with any continuing airworthiness actions that are related to the products, parts or appliances that have been produced.

(e) Establish and maintain an internal occurrence reporting system in the interest of safety, to enable the collection and assessment of occurrence reports in order to identify adverse trends or to address deficiencies, and to extract reportable occurrences. This system shall include evaluation of relevant information relating to occurrences and the promulgation of related information.

(f) 1. Report to the holder of the type-certificate, restricted type-certificate or design approval, all cases where products, parts or appliances have been released by the manufacturer and subsequently identified to have deviations from the applicable design data, and investigate with the holder of the type-certificate, restricted type-certificate or design approval to identify those deviations which could lead to an unsafe condition.

2. Report to DGCA the deviations which could lead to an unsafe condition identified according to subparagraph (1). Such reports shall be made in a form and manner established by DGCA under 21.3A (b)(2) or accepted by DGCA.

3. Where the manufacturer acts as supplier to another production organization, report also to that other organization all cases where it has released products, parts or appliances to that organization and subsequently identified them to have possible deviations from the applicable design data.

### 21.130 Statement of conformity

(a) Each manufacturer of a product, part or appliance manufactured under this Subpart shall raise a Statement of Conformity, a Form CA-52, for complete aircraft, or Form CA- 1, for other products, parts or appliances. This statement shall be signed by an authorized person who holds a responsible position in the manufacturing organization.

(b) A statement of conformity shall include:

1. For each product, part or appliance a statement that the product, part or appliance conforms to the approved design data and is in condition for safe operation

2. For each aircraft, a statement that the aircraft has been ground and flight checked in accordance with point 21.127(a); and

3. For each engine, or variable pitch propeller, a statement that the engine or propeller has been subjected by the manufacturer to a final functional test, in accordance with 21.128, and

4. Additionally in case of engines, a determination according to data provided by the engine type-certificate holder that each completed engine is in compliance with the applicable emissions requirements current at the date of manufacture of the engine.

(c) Each manufacturer of such a product, part or appliance shall:

1. Upon the initial transfer by it of the ownership of such a product, part or appliance; or
2. Upon application for the original issue of an aircraft certificate of airworthiness; or
3. Upon application for the original issue of an airworthiness release document for an engine, a propeller, a part or appliance,

present a current statement of conformity, for validation by DGCA approved authorized signatory.

# SUBPART G — PRODUCTION ORGANISATION APPROVAL FOR PRODUCTS, PARTS AND APPLIANCES

**21.131 Scope**

This Subpart establishes:

(a) The procedure for the issuance of a production organization approval for a production organization showing conformity of products, parts and appliances with the applicable design data.
(b) The rules governing the rights and obligations of the applicant for, and holders of, such approvals.

**21.133 Eligibility**

Any natural or legal person ('organization') shall be eligible as an applicant for an approval under this Subpart. The applicant shall:

(a) justify that, for a defined scope of work, an approval under this Subpart is appropriate for the purpose of showing conformity with a specific design; and
(b) hold an approval of that specific design; or
(c) have ensured, through an appropriate arrangement with the holder of an approval of that specific design, satisfactory coordination between production and design.
(d) Possess design data for parts and appliances obtained through a licence agreement.

Note: In case production organization and Design organization are not company of India, then prior to grant of production organization approval, there should be an agreement acceptable to DGCA India and state of Design that the manufacturing organization cooperates with the organization responsible for type design in assessing information on the design, manufacture and operation of the aircraft, engine or propeller.

**21.134 Application**

Each application for a production organization approval shall be made to DGCA in Form CA-50, and shall include an outline of the information required by 21.143 and the terms of approval requested to be issued under 21.151. An application for production organization approval shall be submitted to DGCA along with requisite fees as applicable.

**21.135 Issue of production organization approval**

An organization shall be entitled to have a production organization approval issued by DGCA when it has demonstrated compliance with the applicable requirements under this Subpart.

**21.139 Quality System**

(a) The production organization shall demonstrate that it has established and is able to maintain a quality system. The quality system shall be documented. This quality system shall be such as to enable the organization to ensure that each product, part or appliance produced by the organization or by its partners, or supplied from or subcontracted to outside parties, conforms to the applicable design data and is in condition for safe operation and thus exercise the privileges set forth in 21.163.

(b) The quality system shall contain:

1. As applicable within the scope of approval, control procedures for:
(i) Document issue, approval, or change.
(ii) Vendor and subcontractor assessment audit and control.
(iii) Verification that incoming products, parts, materials, and equipment, including items supplied new or used by buyers of products, are as specified in the applicable design data.
(iv) Identification and traceability.
(v) Manufacturing processes.
(vi) Inspection and testing, including production flight tests.
(vii) Calibration of tools, jigs, and test equipment.
(viii) Non-conforming item control.
(ix) Airworthiness coordination with the holder of the design approval.
(x) Records completion and retention.
(xi) Personnel competence and qualification.
(xii) Issue of airworthiness release documents.
(xiii) Handling, storage and packing.
(xiv) Internal quality audits and resulting corrective actions.
(xv) Work within the terms of approval performed at any location other than the approved facilities.
(xvi) Work carried out after completion of production but prior to delivery, to maintain the aircraft in a condition for safe operation.
(xvii) 'Special Flight Permit' operation and evaluation of associated flight conditions under this operation, as per the procedures agreed with DGCA.

The control procedures need to include specific provisions for any critical parts.

2. An independent quality assurance function to monitor compliance with, and adequacy of, the documented procedures of the quality system. This monitoring shall include a feedback system to the person or group of persons referred to in 21.145(c) (2) and ultimately to the manager referred to in 21.145(c) (1) to ensure, as necessary, corrective actions.

**21.140 Safety Management System (SMS)**

The production organization shall have a safety management system in accordance with CAR Section 1 Series C Part 1.

**21.143 Exposition**

(a) The organization shall submit to DGCA a production organization exposition providing the following information:

1. A statement signed by the accountable manager confirming that the production organization exposition and any associated manuals which define the approved organization's compliance with this Subpart will be complied with at all times.

2. The title(s) and names of managers accepted by DGCA in accordance with 21.145(c) (2).
3. The duties and responsibilities of the manager(s) as required by 21.145(c) (2) including matters on which they may deal directly with DGCA on behalf of the organization.
4. An organizational chart showing associated chains of responsibility of the managers as required by 21.145(c) (1) and (2).
5. A list of certifying staff as referred to in 21.145(d).
6. A general description of man-power resources.
7. A general description of the facilities located at each address specified in the production organization's certificate of approval.
8. A general description of the production organization's scope of work relevant to the terms of approval.
9. The procedure for the notification of organizational changes to DGCA.
10. The amendment procedure for the production organization exposition.
11. A description of the quality system and the procedures as required by 21.139(b) (1).
12. A list of those outside parties referred to in 21.139(a).
13. The procedure for safety management system is in place as per CAR Section 1 Series C Part 1.

(b) The production organization exposition shall be amended as necessary to remain an up-to-date description of the organization, and copies of any amendments shall be supplied to DGCA.

**21.145 Approval requirements**

The production organization shall demonstrate, on the basis of the information submitted in accordance with 21.143 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 21.165.

(b) with regard to all necessary airworthiness, noise, fuel venting and exhaust emissions data:
1. The production organization is in receipt of such data from DGCA, or from the holder of the type-certificate, restricted type-certificate or design approval, to determine conformity with the applicable design data.
2. 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.
3. 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:

1. A manager has been nominated by the production organization, and is accountable to the DGCA. 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 21.143.
2. 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 CAR, 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 (1). The persons nominated shall be able to show the appropriate knowledge, background and experience to discharge their responsibilities.
3. 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 21.163 under the scope or terms of approval:

1. The knowledge, background (including other functions in the organization), and experience of the certifying staff are appropriate to discharge their allocated responsibilities.
2. The production organization maintains a record of all certifying staff which shall include details of the scope of their authorization.
3. Certifying staff are provided with evidence of the scope of their authorization.

**21.147 Changes to the approved production organization**

(a) After the issue of a production organization approval, each change to the approved production organization that is significant to the showing of conformity or to the airworthiness and characteristics of noise, fuel venting and exhaust emissions of the product, part or appliance, particularly changes to the quality system, shall be approved by DGCA. An application for approval shall be submitted in writing to DGCA and the organization shall demonstrate to DGCA before implementation of the change that it will continue to comply with this Subpart.

(b) DGCA shall establish the conditions under which a production organization approved under this Subpart may operate during such changes unless DGCA determines that the approval should be suspended.

**21.148 Changes of location**

A change of the location of the manufacturing facilities of the approved production organization shall be deemed of significance and therefore shall comply with 21.147.

**21.149 Transferability**

Except as a result of a change in ownership, which is deemed significant for the purposes of 21.147, a production organization approval is not transferable.

**21.151 Terms of approval**

The terms of approval shall identify the scope of work, the products or the categories of parts and appliances, or both, for which the holder is entitled to exercise the privileges under 21.163.
Those terms shall be issued as part of a production organization approval.

**21.153 Changes to the terms of approval**

Each change to the terms of approval shall be approved by DGCA. An application for a change to the terms of approval shall be made in a form and manner established by DGCA. The applicant shall comply with the applicable requirements of this Subpart.

**21.157 Investigations**

A production organization shall make arrangements that allow DGCA to make any investigations, including investigations of partners and subcontractors, necessary to determine compliance and continued compliance with the applicable requirements of this Subpart.

**21.158 Findings**

(a) When objective evidence is found showing non-compliance of the holder of a production organization approval with the applicable requirements of this CAR, the finding shall be classified as follows:

1. A level one finding is any non-compliance with this CAR which could lead to uncontrolled non-compliances with applicable design data and which could affect the safety of the aircraft.
2. A level two finding is any non-compliance with this CAR which is not classified as level one.

(b) A level three finding is any item where it has been identified, by objective evidence, to contain potential problems that could lead to non-compliance under paragraph (a).

(c) After receipt of notification of findings.

1. In case of a level one finding, the holder of the production organization approval shall demonstrate corrective action to the satisfaction of DGCA within a period of 7 working days, extendable up to maximum 21 working days depending upon the complexity of the case after written confirmation of the finding,
2. In case of level two findings, the corrective action period granted by DGCA shall be within three months. In certain circumstances and subject to the nature

of the finding, DGCA may extend the period from three months to six months, subject to a satisfactory corrective action plan agreed by the DGCA.

3. A level three finding shall not require immediate action by the holder of the production organization approval.

(d) In case of level one or level two findings, the production organization approval may be subject to a partial or full limitation, suspension or revocation. The holder of the production organization approval shall provide confirmation of receipt of the notice of limitation, suspension or revocation of the production organization approval in a timely manner.

**21.159 Duration and continued validity**

(a) A production organization approval shall be issued for a limited duration not exceeding five years. It shall remain valid unless:

1. The production organization fails to demonstrate compliance with the applicable requirements of this Subpart; or
2. DGCA is prevented by the holder or any of its partners or subcontractors to perform the investigations in accordance with 21.157; or
3. There is evidence that the production organization cannot maintain satisfactory control of the manufacture of products, parts or appliances under the approval; or
4. The production organization no longer meets the requirements of 21.133; or
5. the certificate has been surrendered or revoked.

(b) Upon surrender or revocation, the certificate shall be returned to DGCA.

**21.163 Privileges**

Pursuant to the terms of approval issued under 21.135, the holder of a production organization approval may:

(a) Perform production activities under this CAR.

(b) In the case of complete aircraft and upon presentation of a Statement of Conformity (Form CA-52) under 21.174, obtain an aircraft certificate of airworthiness and a noise certificate.

(c) In the case of other products, parts or appliances issue authorized release certificates (Form CA-1).

(d) Maintain a new aircraft that it has produced and issue a certificate of release to service (Form CA-53) in respect of that maintenance.

(e) Under the procedures agreed with DGCA, carry out the 'Special Flight Permit' operation and evaluation of flight condition for that operation.

**21.165 Obligations of the holder**

The holder of a production organization approval shall:

(a) Ensure that the production organization exposition furnished in accordance with 21.143 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) 1. Determine that each completed aircraft is airworthy prior to submitting Statements of Conformity to the DGCA, or

2. Determine that other products, parts or appliances are complete and conform to the approved design data and are in a condition for safe operation before issuing Form CA-1 to certify conformity to approved design data and condition for safe operation, and

3. Additionally in case of engines, determine that completed engine is in compliance with the applicable emissions requirements on the date of manufacture of the engine.

4. Determine that other products, parts or appliances conform to the applicable data before issuing Form CA-1as a conformity certificate;

(d) Record all details of work carried out.

(e) Establish and maintain an internal occurrence reporting system in the interest of safety, to enable the collection and assessment of occurrence reports in order to identify adverse trends or to address deficiencies, and to extract reportable occurrences. This system shall include evaluation of relevant information relating to occurrences and the promulgation of related information.

(f) 1. Report to the holder of the type-certificate or design approval, all cases where products, parts or appliances have been released by the production organization and subsequently identified to have possible deviations from the applicable design data, and investigate with the holder of the type-certificate or design approval in order to identify those deviations which could lead to an unsafe condition.

2. Report to DGCA the deviations which could lead to an unsafe condition identified according to subparagraph (1). Such reports shall be made in a form and manner established by DGCA under 21.3A (b)(2) or accepted by DGCA.

3. Where the holder of the production organization approval is acting as a supplier to another production organization, report also to that other organization all cases where it has released products, parts or appliances to that organization and subsequently identified them to have possible deviations from the applicable design data.

(g) Provide assistance to the holder of the type-certificate or design approval in dealing with any continuing airworthiness actions that are related to the products parts or appliances that have been produced.

(h) Establish an archiving system incorporating requirements imposed on its partners, suppliers and subcontractors, ensuring conservation of the data used to justify conformity of the products, parts or appliances. Such data shall be held at the disposal of DGCA and be retained in order to provide the information necessary to ensure the continuing airworthiness of the products, parts or appliances.

(i) Where, under its terms of approval, the holder issues a certificate of release to service, determine that each completed aircraft has been subjected to necessary maintenance and is in condition for safe operation, prior to issuing the certificate

(j) Where applicable, under the privilege of 21.163 (e), determine the conditions under which an operation under 'Special Flight Permit' can be performed.

# SUBPART H — AIRWORTHINESS CERTIFICATES, SPECIAL CERTIFICATE OF AIRWORTHINESS AND EXPORT CERTIFICATE OF AIRWORTHINESS

**21.171 Scope**

This Subpart prescribes procedural requirements for the issue of Certificates of Airworthiness, Special Certificates of Airworthiness, Export Certificate of Airworthiness for new aircraft manufactured / assembled in India only.

**21.172 Eligibility**

Any natural or legal person under whose name an aircraft is registered or its representative shall be eligible as an applicant for an airworthiness certificate for that aircraft under this Subpart.

**21.173 Classification**

Airworthiness certificates shall be classified as follows:

(a) Certificates of airworthiness shall be issued to aircraft which conform to a type-certificate that has been issued in accordance with this CAR.

(b) Special certificates of airworthiness shall be issued to aircraft:

1. which conform to a restricted type-certificate that has been issued in accordance with this CAR; or
2. which have been shown to DGCA to comply with specific airworthiness codes ensuring adequate safety.

**21.174 Application**

(a) Pursuant to 21.172, an application for an airworthiness certificate shall be made in form CA-25.

(b) Each application for a certificate of airworthiness or special certificate of airworthiness shall include the class of airworthiness certificate applied for with regard to aircraft:

(1) A statement of conformity:
— issued under 21.163(b), or
— issued under 21.130
— or, for an imported aircraft, a statement signed by the exporting Authority that the aircraft conforms to a design approved by the Authority/ Export Certificate of Airworthiness.
(2) A weight and balance report with a loading schedule.
(3) The flight manual, when required by the applicable airworthiness code for the particular aircraft.

(c) Unless otherwise agreed, the statements referred to in subparagraphs (b)(1), shall be issued no more than 60 days before presentation of the aircraft to DGCA.

(d) An application for airworthiness certificate shall be submitted to DGCA along with the requisite fees as applicable.

**21.175 Language**

Placards related to public information shall be presented in bi-lingual, i.e. Hindi and English. Placards not related to public information, manuals, listings, and instrument markings and other necessary information required by applicable airworthiness codes shall be presented in English only.

**21.177 Amendment or modification**

An airworthiness certificate may be amended or modified only by DGCA.

**21.179 Transferability**

Where ownership of an aircraft has changed the certificate of airworthiness, or the special certificate of airworthiness conforming to a restricted type-certificate only, shall be transferred together with the aircraft;

**21.180 Inspections**

The holder of the airworthiness certificate shall provide access to the aircraft for which that airworthiness certificate has been issued upon request by DGCA.

**21.181 Duration and continued validity**

(a) An airworthiness certificate shall be issued for the period in accordance with the regulation laid down in CAR Section 2 (Airworthiness), Series F, Part III. It shall remain valid subject to:

1. compliance with the applicable type-design and continuing airworthiness requirements;(refer CAR Section 2 (Airworthiness), Series F, Part III ) and
2. the aircraft remaining on the Indian register; and
3. the type-certificate or restricted type-certificate under which it is issued not being previously invalidated under 21.51.
4. the certificate not being surrendered.

(b) Upon surrender or revocation, the certificate shall be returned to DGCA.

**21.182 Aircraft identification**

Each applicant for an airworthiness certificate under this Subpart shall demonstrate that its aircraft is identified in accordance with Subpart Q.

**21.183 Issue of certificates of airworthiness for new aircraft**

DGCA shall issue a certificate of airworthiness for new aircraft:

(i) Upon presentation of the documentation required by 21.174(b).

(ii) When the aircraft is airworthy. This may include inspections by DGCA.

**21.184 Issue of special certificates of airworthiness for new aircraft**

DGCA shall issue a special certificate of airworthiness for new aircraft:

(a) upon presentation of the documentation required by 21.174(b) demonstrating that the aircraft conforms to a design approved by DGCA under a restricted type-certificate or in accordance with specific airworthiness codes, and is in condition for safe operation.

(b) Limitations for use will be associated with special certificates of airworthiness including airspace restrictions as necessary to take account of deviations from essential requirements for airworthiness laid down in the regulation.

**21.185 Application for an Export Certificate of Airworthiness**

(a) An application for an Export Certificate of Airworthiness must be made in a form and manner acceptable to DGCA and be submitted to DGCA along with the requisite fees as applicable.

(b) For each new aircraft, each application must include, or reference, as applicable-

(1) A Statement of Conformity
(2) A weight and Balance report, with a loading schedule when applicable in accordance with the applicable CAR.
(3) A maintenance manual.
(4) Evidence of compliance with the applicable Airworthiness Directives. A suitable notation must be made when such Directives are not complied with.
(5) When temporary installations are incorporated in an aircraft for the purpose of export delivery, the applicable form must include a general description of the installations together with a statement that the installation will be removed and the aircraft restored to the approved configuration upon completion of the delivery flight.
(6) A description of the methods used, if any, for the preservation and packaging of such aircraft to protect them against corrosion and damage while in transit or storage. The description must also indicate the duration of the effectiveness of such methods.
(7) A Flight Manual.
(8) A statement as to the date on which any documents not made available at the date of application are expected to be available.
(9) A statement as to the date when title passed or is expected to pass to a foreign purchaser.

**21.186 Issue of Export Certificate of Airworthiness (for new aircraft)**

(a) The DGCA issues an Export Certificate of Airworthiness if the applicant shows, except as provided in sub-paragraph (b) of this paragraph, that

(1) The aircraft conforms to the Type Design acceptable to the importing Country.

(2) The aircraft has been produced under Subpart F and G of this CAR 21.

(3) The aircraft meets the additional requirements for import of the importing country if they have been notified.

(4) All documents listed in CAR 21.185(b) have been submitted.

(5) The aircraft is identified in accordance with Subpart Q of this CAR 21.

(b) An aircraft need not meet a requirement specified in sub-paragraph (a) (1) to (4) of this paragraph as applicable, if acceptable to the importing country and the importing country indicates that acceptability.

NOTE: In case of 'Export C of A' for old aircraft, relevant requirements of CAR Section 2 (Airworthiness) will be followed.

**21.187 Use of Authorised Release Document for Export**

(a) An Authorised Released Document may only be used in connection with the export of a product other than aircraft, or a part or appliance, where-

(1) The Authorised Release Document has been issued in accordance with the applicable CARs; and

(2) The product other than aircraft, or part or appliance, meets the additional requirements for import of the importing country.

(b) A product other than aircraft, or part or appliance, need not meet a requirement specified in sub-paragraph (a) of this paragraph if acceptable to the importing country and the importing country indicates that acceptability.

# SUBPART I — NOISE CERTIFICATES

**21.201 Scope**

This Subpart establishes the procedure for issuing noise certificates.

**21.202 Requirements**

For the purpose of noise certification the aircraft designed, developed and operated in India shall meet compliance with 21.18.

**21.203 Eligibility**

Any natural or legal person under whose name an aircraft is registered or will be registered or its representative shall be eligible as an applicant for a noise certificate for that aircraft under this Subpart.

**21.204 Application**

(a) Pursuant to 21.203, an application for a noise certificate shall be made along with requisite fees as applicable in form CA2006-1.

(b) Each application shall include:
  (i) A statement of conformity:
    — issued under 21.163(b), or
    — issued under 21.130,
    — or, for an imported aircraft, a statement, signed by the exporting Authority that the aircraft conforms to a design approved by the Authority and
  (ii) The noise information determined in accordance with the applicable noise requirements.

(c) Unless otherwise agreed, the statements referred to in subparagraphs (b), shall be issued no more than 60 days before presentation of the aircraft to DGCA.

**21.205 Issue of noise certificates**

DGCA shall issues a noise certificate upon presentation of the documents required by 21.204(b).

**21.207 Amendment or modification**

A noise certificate may be amended or modified only by DGCA.

**21.209 Transferability**

Where ownership of an aircraft has changed, the noise certificate shall be transferred together with the aircraft.

**21.210 Inspections**

The holder of the noise certificate shall provide access to the aircraft for which that noise certificate has been issued upon request by DGCA.

**21.211 Duration and continued validity**

(a) A noise certificate shall be issued for an unlimited duration. It shall remain valid subject to:
1. compliance with the applicable type-design, environmental protection and continuing airworthiness requirements; and
2. the aircraft remaining on the Indian register; and
3. the type-certificate or restricted type-certificate under which it is issued not being previously invalidated under 21.51.
4. the certificate not being surrendered.

(b) Upon surrender or revocation, the certificate shall be returned to DGCA

**21.212 Investigations**

(a) DGCA may perform inspection of the aircraft to justify the issuance, maintenance, amendments, suspension or revocation of the certificate.
(b) DGCA shall examine the application and supporting documentation for the following:
(i) evaluation of eligibility.
(ii) evaluation of documents received with the application.
(iii) inspection of aircraft

**21.213 Suspension and revocation of a noise certificate**

(a) Upon evidence that some of the condition specified in 21.211 (a) are not met, the DGCA shall suspend or revoke the noise certificate.
(b) Upon issuance of notice of suspension or revocation of a noise certificate, DGCA shall state the reasons for suspension and revocation.

**21.214 Record keeping**

(a) DGCA shall keep a record that allows adequate traceability of the process to issue, maintain, amend, suspend or revoke each individual noise certificate.

(b) The record shall at least contain:
(i) the documents provided by the applicant;
(ii) the documents established during the investigation, in which the activities and the final results defined in 21.212(b) including inspection of aircraft are stated.
(iii) a copy of the certificate including amendments.

(c) The records shall be archived for a minimum retention period of six years after leaving the register.

# SUBPART JA — DESIGN ORGANISATION APPROVAL - PRODUCTS OR CHANGES TOPRODUCTS

**21. A231 Scope**

This Subpart establishes the procedure for the approval of design organizations designing products, changes to products thereto and rules governing the rights and obligations of applicants for, and holders of, such approvals.

**21. A233 Eligibility**

Any natural or legal person ('organization') shall be eligible as an applicant for an approval under this Subpart

(a) in accordance with 21.14, 21.97 (a) (4), 21.112B, 21.432B or 21.602B; or

(b) for approval of minor changes or minor repair design, when requested for the purpose of obtaining privileges under 21.A263.

**21. A234 Application**

Each application for a design organization approval under this Subpart shall be made along with requisite fees as applicable in form CA-80A and shall include an outline of the information required by 21.A243, and the terms of approval requested to be issued under 21.A251.

**21. A235 Issue of design organization approval**

An organization shall be entitled to have a design organization approval issued by DGCA when it has demonstrated compliance with the applicable requirements under this Subpart.

**21. A239 Design assurance system**

(a) The design organization shall demonstrate that it has established and is able to maintain a design assurance system for the control and supervision of the design, and of design changes, of products covered by the application. This design assurance system shall be such as to enable the organization:

1. To ensure that the design of the products or the design change thereof, comply with the applicable type-certification basis and environmental protection requirements; and
2. To ensure that its responsibilities are properly discharged in accordance with:

(i) The appropriate provisions of this CAR; and
(ii) The terms of approval issued under 21.A251.

3. To independently monitor the compliance with, and adequacy of, the documented procedures of the system. This monitoring shall include a feed-back system to a person or a group of persons having the responsibility to ensure corrective actions.

(b) The design assurance system shall include an independent checking function of the showings of compliance on the basis of which the organization submits compliance statements and associated documentation to DGCA.

(c) The design organization shall specify the manner in which the design assurance system accounts for the acceptability of the parts or appliances designed or the tasks performed by partners or subcontractor according to methods which are the subject of written procedures.

**21. A243 Data**

(a) The design organization shall furnish a handbook to DGCA describing, directly or by cross-reference, the organization, the relevant procedures and the products or changes to products to be designed.

(b) Where any parts or appliances or any changes to the products are designed by partner organizations or subcontractors, the handbook shall include a statement of how the design organization is able to give, for all parts and appliances, the assurance of compliance required by 21.A239 (b), and shall contain, directly or by cross-reference, descriptions and information on the design activities and organization of those partners or subcontractors, as necessary to establish this statement.

(c) The handbook shall be amended as necessary to remain an up-to-date description of the organization, and copies of amendments shall be supplied to DGCA.

(d) The design organization shall furnish a statement of the qualifications and experience of the management staff and other persons responsible for making decisions affecting airworthiness and environmental protection in the organization.

(e) The design organization shall furnish a SMS manual to DGCA describing, the policies and procedures for managing safety, including the necessary organizational structures, accountabilities for aeronautical products developed by JA and parts or appliances designed or the tasks performed by partners or subcontractor.

**21. A245 Approval requirements**

The design organization shall demonstrate, on the basis of the information submitted in accordance with 21.A243 that, in addition to complying with 21.A239:

(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 and environmental protection objectives for the products.

(b) There is full and efficient coordination between departments and within departments in respect of airworthiness and environmental protection matters.

(c) The design organization shall have a Safety Management System in accordance with CAR Section 1, Series C, Part 1, with an aim to managing safety, including the necessary organizational structures, accountabilities, policies and procedures for aeronautical products developed by JA and parts or appliances designed or the tasks performed by partners or subcontractor.

**21. A247 Changes in design assurance system**

After the issue of a design organization approval, each change to the design assurance system that is significant to the showing of compliance or to the airworthiness and environmental protection of the product shall be approved by DGCA. An application for approval shall be submitted in writing to DGCA and the design organization shall demonstrate to DGCA, on the basis of submission of proposed changes to the handbook, and before implementation of the change, that it will continue to comply with this Subpart after implementation.

**21. A249 Transferability**

Except as a result of a change in ownership, which is deemed significant for the purposes of 21.A247, a design organization approval is not transferable.

**21. A251 Terms of approval**

The terms of approval shall identify the types of design work, the categories of products for which the design organization holds a design organization approval and the functions and duties that the organization is approved to perform in regard to the airworthiness and characteristics of noise, fuel venting and exhaust emissions of products. For design organization approval covering type-certification or ITSO authorization for Auxiliary Power Unit (APU), the terms of approval shall contain in addition the list of products or APU. Those terms shall be issued as part of a design organization approval.

**21. A253 Changes to the terms of approval**

Each change to the terms of approval shall be approved by DGCA. An application for a change to the terms of approval shall be made in a form and manner established (Form CA-82A) by DGCA. The design organization shall comply with the applicable requirements of this Subpart.

**21. A257 Investigations**

(a) The design organization shall make arrangements that allow DGCA to make any investigations, including investigations of partners and subcontractors, necessary to determine compliance and continued compliance with the applicable requirements of this Subpart.

(b) The design organization shall allow DGCA to review any report and make any inspection and perform or witness any flight and ground test necessary to check the validity of the compliance statements submitted by the applicant under 21.A239 (b).

**21. A258 Findings**

(a) When objective evidence is found showing non-compliance of the holder of a design organization approval with the applicable requirements of this CAR, the finding shall be classified as follows:

1. A level one finding is any non-compliance with this CAR which could lead to uncontrolled non-compliances with applicable requirements and which could lower the safety standard and hazards seriously the safety of the aircraft.
2. A level two finding is any non-compliance with this CAR which is not classified as level one and which could lower the safety standard and possibly hazard the safety of the aircraft.
3. A level three finding is any item where it has been identified, by objective evidence, to contain potential problems that could lead to non-compliance under paragraph (a)(1) & (2) above.

(b) After receipt of notification of findings under the applicable administrative procedures established by DGCA,

1. In case of a level one finding, the holder of the design organization approval shall demonstrate/address the corrective action immediately to the satisfaction of DGCA after written notification or confirmation of the finding;
2. In case of level two findings, the corrective action period granted by DGCA shall be within a time not exceeding 30 days. In certain circumstances and subject to the nature of the finding, where the organization has not implemented the necessary corrective action within a period of 30 days, it may be granted a further period of 15 days by the Regional head of office subject to notifying the Head of Design Organization (HODO). The past performance of the organization will be considered while granting the additional time period for corrective action.
3. A level three finding shall not require immediate action by the holder of the design organization approval.

(c) Time period for compliance shall be counted from the next calendar day of the date of raising the DRF (Deficiency Reporting Forms).

(d) Where no reasonable and justified reasons are assigned for non-implementation of the corrective action plan within the time frame agreed upon with DGCA office, necessary enforcement action will be initiated against the organization or the person responsible for non-compliance as the case may be.

**21. A259 Duration and continued validity**

(a) A design organization approval shall be issued for a limited period of not exceeding five years. It shall remain valid unless:

1. the design organization fails to demonstrate compliance with the applicable requirements of this Subpart; or
2. DGCA is prevented by the holder or any of its partners or subcontractors to perform the investigations in accordance with 21.A257; or
3. 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; or
4. the certificate has been surrendered or revoked under the applicable administrative procedures established by DGCA.

(b) Upon surrender or revocation, the certificate shall be returned to DGCA.

**21. A263 Privileges**

(a) The holder of a design organization approval shall be entitled to perform design activities under this CAR and within its scope of approval.

(b) Subject to 21.A257(b), the DGCA shall accept with further verification the following compliance documents submitted by the applicant for the purpose of obtaining:
1. the approval of flight conditions required for a Special Flight Permit ;or.
2. a type-certificate or approval of a major change to a type design/type certificate; or
3. a supplemental type-certificate; or
4. an ITSO authorization under point 21.602B(c)(1);or
5. a major repair design approval;

(c) 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:

1. to classify changes to type design/type certificate and repairs as 'major' or 'minor' as per the procedures agreed with DGCA
2. to approve minor changes to type design/type certificate and minor repairs
3. to issue information or instructions containing the following statement: 'The technical content of this document is approved under the authority of DOA ref. [DGCA]. 21JA. [xyz].'
4. to approve documentary changes to the aircraft flight manual and supplements, and issue such changes containing the following statement: 'Revision nr. xx to AFM and supplement ref. yyy, is approved under the authority of DOA ref. [DGCA].21JA.[xyz].' , as per the procedures agreed with DGCA).
5. to propose the design of major repairs to products or Auxiliary Power Unit for which it holds the type-certificate or the supplemental type-certificate or ITSO authorisation, as per the procedures agreed with DGCA..
6. to evaluate and propose the conditions under which a operation under 'Special Flight Permit' can be carried out in accordance with the agreement with DGCA.
7. (Reserved)

**21. A265 Obligations of the holder**

The holder of a design organization approval shall:

(a) Maintain the handbook in conformity with the design assurance system;
(b) Ensure that this handbook is used as a basic working document within the organization;
(c) Determine that the design of products, or changes or repairs thereof, as applicable, complies with applicable requirements and have no unsafe feature;
(d) For all changes or repairs, provide to DGCA statements and associated documentation confirming compliance with paragraph (c);
(e) Provide to DGCA information or instructions related to required actions under 21.3B.

# SUBPART JB — DESIGN ORGANISATION APPROVAL – PARTS & APPLIANCES

**21. B231 Applicability**

This Subpart prescribes procedural requirements for the approval of design organizations designing parts and appliances or changes thereto and requirements governing the holders of such approvals.

**21. B233 Eligibility**

DGCA will only accept an application for a Design Organization Approval covering the Design of parts or appliances, or changes thereof, if DGCA agrees that such an approval is appropriate for the purpose of assisting applicants for or holders of Type Certificates in showing compliance with the applicable airworthiness requirements.

**21. B234 Application**

Each application for a Design Organization Approval must be made along with requisite fees as applicable in form CA-80B and must include an outline of the information required by 21.B243 and the Terms of Approval requested to be issued under 21.B251.

**21. B235 Requirements for issue**

DGCA issues a Design Organization Approval when it is satisfied that compliance has been shown with the applicable requirements of this Subpart.

**21. B239 Design Assurance System**

(a) The applicant must show that the Organization has established and can maintain a Design Assurance System for the control and supervision of the design, and of design changes, of parts and appliances covered by the application. This Design Assurance System must be such as to enable the Organization -
  (1) To assist the applicant for a Type Certificate in the manner specified in 21.A239(c), in ensuring that the design of the parts and appliances, or the design change thereof, comply with the applicable requirements; and
  (2) To ensure that its responsibilities are properly discharged in accordance with –
    (i) The appropriate regulations of this CAR-21; and
    (ii) The Terms of Approval issued under 21.B251.
  (3) To independently monitor the compliance with, and adequacy of, the documented procedures of the system. This monitoring must include a feed-back system to a person or a group of persons having the responsibility to ensure corrective actions.

(b) The Design Assurance System must include an independent checking function of the showings of compliance.

(c) The applicant must specify the manner in which the Design Assurance System accounts for the acceptability of the parts or appliances designed or the tasks performed by partners or sub-contractors according to methods, which are the subject of written procedures.

**21. B243 Data Requirements**

(a) The applicant must furnish a handbook to DGCA, which must describe either directly, or by cross-reference the Organization, the relevant procedures and the parts and appliances or changes thereto, to be designed.

(b) Where any parts or appliances or any changes to the products are designed by partner organizations or subcontractors of the applicant, the handbook must include a statement of how the applicant will be able to give, for all parts and appliances the assurance of compliance required by 21.B239 (b), and must contain, directly or by cross- reference, descriptions and information on the design activities and organization of those partners and subcontractors, as necessary to establish this statement.

(c) The handbook shall be amended as necessary to remain an up-to-date description of the Organization, and copies of amendments shall be supplied to DGCA.

(d) The applicant must furnish a statement of the qualifications and experience of the management staff and other persons responsible for making decisions affecting airworthiness in the Organization.

**21. B245 Requirements for Approval**

The information submitted in accordance with 21.B243 must show that, in addition to complying with 21.B239.

(a) The staff in all technical departments is of sufficient numbers and experience and has 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 objectives for the part or appliance.

(b) There is full and efficient co-ordination between departments and within departments in respect to airworthiness matters.

**21. B247 Changes in Design Assurance System**

After the grant of a Design Organization Approval, each change to the Design Assurance System that is significant to the showing of compliance must be approved by DGCA. An application for approval shall be submitted in writing to DGCA and the Design Organization shall show, to the satisfaction of DGCA, on the basis of submission of proposed changes to the handbook, and before implementation of the change, that it will continue to comply with 21.B245, after implementation.

**21. B249 Transferability**

Except for a change in ownership of the Organization, which must be regarded as a change of significance, and must therefore comply with 21.B247, a Design Organization Approval is not transferable.

**21. B251 Terms of Approval**

Terms of Approval are issued as part of a design organization Approval. This lists the types of design work and the categories of the parts or appliances for which the design organization holds a Design Organization Approval, and the functions and duties that the Organization is approved to perform in regard to the airworthiness of parts or appliances.

**21. B253 Change to the Terms of Approval**

Each change to the Terms of Approval must be approved by DGCA. Application for a change to the Terms of Approval must be made in writing to DGCA. The applicant must comply with the applicable requirements of this Subpart.

**21. B257 Investigations**

Each holder of, or applicant for, a Design Organization Approval shall make arrangements that allow DGCA to make any investigations necessary to determine compliance with the applicable regulations in this Subpart.

**21. B258 Findings**

(a) When objective evidence is found showing non-compliance of the holder of a design organization approval with the applicable requirements of this CAR, the finding shall be classified according to guidelines specified in enforcement circular No. 1/2009 dated 01.09.2009 as follows:

1. A level one finding is any non-compliance with this CAR which could lead to uncontrolled non-compliances with applicable requirements and which could lowers the safety standard and hazards seriously the safety of the aircraft.
2. A level two finding is any non-compliance with this CAR which is not classified as level one and which could lower the safety standard and possibly hazard the safety of the aircraft.
3. A level three finding is any item where it has been identified, by objective evidence, to contain potential problems that could lead to non-compliance under paragraph (a)(1) & (2) above.

(b) After receipt of notification of findings under the applicable administrative procedures established by DGCA,

1. In case of a level one finding, the holder of the design organization approval shall demonstrate/address the corrective action immediately to the satisfaction of DGCA after written notification or confirmation of the finding;

2. In case of level two findings, the corrective action period granted by DGCA shall be within a time not exceeding 30 days. In certain circumstances and subject to the nature of the finding, where the organization has not implemented the necessary corrective action within a period of 30 days, it may be granted a further period of 15 days by the Regional head of office subject to notifying the Head of Design Organization (HODO). The past performance of the organization will be considered while granting the additional time period for corrective action.
3. A level three finding shall not require immediate action by the holder of the design organization approval.

(c) Time period for compliance shall be counted from the next calendar day of the date of raising the DRF (Deficiency Reporting Forms).

(d) Where no reasonable and justified reasons are assigned for non-implementation of the corrective action plan within the time frame agreed upon with DGCA office, necessary enforcement action will be initiated against the organization or the person responsible for non-compliance as the case may be.

**21. B259 Duration**

(a) A Design Organization Approval remains valid for a maximum period of five years unless-

(1) Surrendered by the holder of the Design Organization Approval; or
(2) Suspended or revoked by DGCA; or
(3) The end of a specified duration; or
(4) A termination date otherwise established by DGCA.

(b) DGCA may restrict, suspend or revoke a Design Organization Approval if it -

(1) Finds that the Organization does not comply with the applicable requirements of this Subpart; or
(2) Is prevented by the holder or any of its sub-contractors to perform the investigations in accordance with 21.B257; or
(3) Finds evidence that the Design Assurance System cannot maintain satisfactory control and supervision of the design of parts and appliances, or changes thereof, under the approval.

**21. B265 Responsibility of Holder of Design Organization Approval**

The holder of a Design Organization Approval shall –

(a) Maintain the handbook in conformity with the Design Assurance System.

(b) Ensure that this handbook is used as a basic working document within the Organization.

# SUBPART K — PARTS AND APPLIANCES

**21.301 Scope**

This Subpart establishes the procedure relating to the approval of parts and appliances.

**21.303 Compliance with applicable requirements**

The showing of compliance of parts and appliances to be installed in a type-certificated product shall be made:

(a) In conjunction with the type-certification procedures of Subpart B, D or E for the product in which it is to be installed; or

(b) Where applicable, under the ITSO authorization procedures of Subpart O; or

(c) In the case of standard parts, in accordance with officially recognized Standards.

**21.305 Approval of parts and appliances**

In all cases where the approval of a part or appliance is explicitly required by DGCA, the part or appliance shall comply with the applicable ITSO or with the specifications recognized as equivalent by DGCA in the particular case.

**21.307 Release of parts and appliances for installation**

No part or appliance (except a standard part), shall be eligible for installation in a type-certificated product unless it is:

(a) Accompanied by an authorized release certificate (Form CA-1), certifying that the item is airworthy; and
(b) Marked in accordance with Subpart Q.

# SUBPART L — NOT APPLICABLE

## SUBPART M — REPAIRS

### 21.431 Scope

(a) This Subpart establishes the procedure for the approval of repair design, and establishes the rights and obligations of the applicants for, and holders of, those approvals.

(b) A 'repair' means elimination of damage and/or restoration to an airworthy condition following initial release into service by the manufacturer of any product, part or appliance.

(c) Elimination of damage by replacement of parts or appliances without the necessity for design activity shall be considered as a maintenance task and shall therefore requires no approval under this CAR.

(d) A repair to an ITSO article other than an Auxiliary Power Unit (APU) shall be treated as a change to the ITSO design and shall be processed in accordance with 21.611.

### 21.432A Eligibility

(a) Any natural or legal person that has demonstrated, or is in the process of demonstrating, its capability under 21.432B, shall be eligible as an applicant for a major repair design approval under the conditions laid down in this Subpart.

(b) Any natural or legal person shall be eligible to apply for approval of a minor repair design.

### 21.432B Demonstration of capability

(a) An applicant for a major repair design approval shall demonstrate its capability by holding a design organization approval, issued by DGCA in accordance with Subpart JA.

(b) By way of derogation from paragraph (a), as an alternative procedure to demonstrate its capability, an applicant may seek DGCA agreement for the use of procedures setting out the specific design practices, resources and sequence of activities necessary to comply with this Subpart.

### 21.433 Repair design

(a) The applicant for approval of a repair design shall:

1. Show compliance with the type-certification basis and environmental protection requirements incorporated by reference in the type-certificate or supplemental type-certificate or APU ITSO authorisation, as applicable, or those in effect on the date of application (for repair design approval), plus any amendments to those airworthiness codes or special conditions DGCA finds necessary to establish a level of safety equal to that established by

the type-certification basis incorporated by reference in the type-certificate or supplemental type-certificate or APU ITSO authorisation.
2. Submit all necessary substantiation data, when requested by DGCA.
3. Declare compliance with the airworthiness codes and environmental protection requirements of subparagraph (a)(1).

(b) Where the applicant is not the type-certificate or supplemental type-certificate or APU ITSO authorisation holder, as applicable, the applicant may comply with the requirements of paragraph (a) through the use of its own resources or through an arrangement with the type-certificate or supplemental type-certificate or APU ITSO authorisation holder as applicable.

**21.435 Classification of repairs**

(a) A repair may be 'major' or 'minor'. The classification shall be made in accordance with the criteria of 21.91 for a change in the type design/type certificate.

(b) A repair shall be classified 'major' or 'minor' under paragraph (a) either:

1. By DGCA, or
2. By an appropriately approved design organization under a procedure agreed with DGCA.

**21.437 Issue of a repair design approval**

When it has been declared and has been shown that the repair design meets the applicable airworthiness codes and environmental protection requirements of 21.433(a) (1), it shall be approved:

(a) by DGCA, or

(b) (Reserved)

(c) for minor repairs only, by an appropriately approved design organization under a procedure agreed with DGCA.

**21.439 Production of repair parts**

Parts and appliances to be used for the repair shall be manufactured in accordance with production data based upon all the necessary design data as provided by the repair design approval holder:

(a) Under Subpart F, or

(b) By an organization appropriately approved in accordance with Subpart G, or

(c) By an appropriately approved maintenance organization.

**21.441 Repair embodiment**

(a) The embodiment of a repair shall be made by an appropriately approved maintenance organization, or by a production organization appropriately approved in accordance with Subpart G, under 21.163 privileges.

(b) The design organization shall transmit to the organization performing the repair all the necessary installation instructions.

**21.443 Limitations**

A repair design may be approved subject to limitations, in which case the repair design approval shall include all necessary instructions and limitations. These instructions and limitations shall be transmitted by the repair design approval holder to the operator in accordance with a procedure agreed with DGCA.

**21.445 Un-repaired damage**

(a) When a damaged product, part or appliance, is left un-repaired, and is not covered by previously approved data, the evaluation of the damage for its airworthiness consequences may only be made;

1. by DGCA, or
2. by an appropriately approved design organization under a procedure agreed with DGCA.

Any necessary limitations shall be processed in accordance with the procedures of 21.443.

(b) Where the organization evaluating the damage under paragraph (a) is neither DGCA nor the type-certificate or supplemental type-certificate or APU ITSO authorisation holder, this organization shall justify that the information on which the evaluation is based is adequate either from its organization's own resources or through an arrangement with the type-certificate or supplemental type-certificate or APU ITSO authorisation holder, or manufacturer, as applicable.

**21.447 Record keeping**

For each repair, all relevant design information, drawings, test reports, instructions and limitations possibly issued in accordance with 21.443, justification for classification and evidence of the design approval, shall:

(a) be held by the repair design approval holder at the disposal of DGCA, and

(b) be retained by the repair design approval holder in order to provide the information necessary to ensure the continued airworthiness of the repaired products, parts or appliances.

**21.449 Instructions for continued airworthiness**

(a) The holder of the repair design approval shall furnish at least one complete set of those changes to the instructions for continued airworthiness which result from the design of the repair, comprising descriptive data and accomplishment instructions prepared in accordance with the applicable requirements, to each operator of aircraft incorporating the repair. The repaired product, part or appliance may be released into service before the changes to those instructions have been completed, but this shall be for a limited service period, and in agreement with DGCA. Those changes to the instructions shall be made available on request to any other person required to comply with any of the terms of those changes to the instructions. The availability of some manual or portion of the changes to the instructions for continued airworthiness, dealing with overhaul or other forms of heavy maintenance, may be delayed until after the product has entered into service, but shall be available before any of the products reaches the relevant age or flight — hours/cycles.

(b) If updates to those changes to the instructions for continued airworthiness are issued by the holder of the repair design approval after the repair has been first approved, these updates shall be furnished to each operator and shall be made available on request to any other person required to comply with any of the terms of those changes to the instructions. A programme showing how updates to the changes to the instructions for continued airworthiness are distributed shall be submitted to DGCA.

(c) When Indian authorities approve the modification on a product, which has been designed in any other State, DGCA shall transmit the mandatory continuing airworthiness information to all States that have the modified aircraft on their registries.

(d) When distributing mandatory continuing airworthiness information, it shall be ensured that sensitive aviation security information is not transmitted to anyone other than to the appropriately authorized entity in a secured manner.

**21.451 Obligation**

(a) Each holder of a major repair design approval shall:

1. undertake the obligations:

   (i) laid down in 21.3A, 21.3B, 21.4, 21.439, 21.441, 21.443, 21.447 and 21.449;
   (ii) implicit in the collaboration with the type-certificate or supplemental type-certificate or APU ITSO authorisation holder, or both, under 21.433 (b), as appropriate.
2. specify the marking, in accordance with 21.804(a).

(b) Except for type-certificate holders or APU ITSO authorisation holder for which 21.44 apply, the holder of a minor repair design approval shall:

1. undertake the obligations laid down in 21.4, 21.447 and 21.449; and
2. specify the marking, including IPA letters, in accordance with 21.804(a).

# SUBPART N — NOT APPLICABLE

# SUBPART O — INDIAN TECHNICAL STANDARD ORDER AUTHORISATION

**21.601 Scope**

(a) This Subpart establishes the procedure for issuing Indian Technical Standard Order authorization and the rules governing the rights and obligations of applicants for, or holders of, such authorizations.

(b) An article produced under an ITSO authorization is an approved article for the purpose of Subpart K.

**21.602A Eligibility**

Any natural or legal person that produces or is preparing to produce an ITSO article, and that has demonstrated, or is in the process of demonstrating, its capability under 21.602B shall be eligible as an applicant for an ITSO authorization.

**21.602B Demonstration of capability**

Any applicant for an ITSO authorization shall demonstrate its capability as follows:

(a) For development of prototype(s)/test platform(s)/test specimen(s), in line with the provision specified either in Subpart F or as may be specified by DGCA without any fees.

(b) for production, by holding a production organization approval, issued in accordance with Subpart G, or through compliance with Subpart F procedures; and

(c) for design:

1. for an Auxiliary Power Unit, by holding a design organization approval, issued by DGCA in accordance with Subpart JA;
2. for all other articles, by using procedures setting out the specific design practices, resources and sequence of activities necessary to comply with this subpart.

**21.603 Application**

(a) An application for an ITSO authorization shall be made along with requisite fees as applicable in form CA-34 and shall include an outline of the information required by 21.605.

(b) When a series of minor changes in accordance with 21.611 is anticipated, the applicant shall set forth in its application the basic model number of the article and the associated part numbers with open brackets after it to denote that suffix change letters or numbers (or combinations of them) will be added from time to time.

(c) Subpart M is applicable to the approval of repair design.

**21.604 ITSO Authorization for an Auxiliary Power Unit (APU)**

With regard to ITSO authorization for an Auxiliary Power Unit:

(a) 21.15, 21.16B, 21.17, 21.20, 21.21, 21.31, 21.33, 21.44 shall apply by way of derogation from 21.603, 21.606(c), 21.610 and 21.615, except that an ITSO Authorization shall be issued in accordance with 21.606 instead of the type-certificate;

(b) Subpart D or Subpart E of CAR 21 is applicable for the approval of design changes by way of derogation from 21.611. When Subpart E is used, a separate ITSO authorization shall be issued instead of a supplemental type-certificate.

**21.605 Data requirements**

The applicant shall submit the following documents, to DGCA:

(a) A statement of compliance certifying that the applicant has met the requirements of this Subpart.

(b) A Declaration of Design and Performance (DDP).

(c) One copy of the technical data required in the applicable ITSO.

(d) The exposition (or a reference to the exposition) referred to in 21.143 for the purpose of obtaining an appropriate production organization approval under Subpart G or the manual (or a reference to the manual) referred to in 21.125A(b) for the purpose of manufacturing under Subpart F without production organization approval.

(e) For an APU, the handbook (or a reference to the handbook) referred to in 21.A243 for the purpose of obtaining an appropriate design organization approval under Subpart JA.

(f) for all other articles, the procedures referred to in 21.602B(c)(2).

**21.606 Issue of ITSO authorization**

The applicant shall be entitled to have an ITSO authorization issued by DGCA after:

(a) demonstrating its capability in accordance with 21.602B; and

(b) demonstrating that the article complies with the technical conditions of the applicable ITSO, and submitting the corresponding statement of compliance.

(c) showing that it is able to comply with 21.609.

**21.607 ITSO authorization privileges**

The holder of an ITSO authorization is entitled to produce and mark the article with the appropriate ITSO marking.

**21.608 Declaration of Design and Performance (DDP)**

(a) The DDP shall contain at least the following information:

1. Information corresponding to 21.31(a) and (b), identifying the article and its design and testing standard.
2. The rated performance of the article, where appropriate, either directly or by reference to other supplementary documents.
3. A statement of compliance certifying that the article has met the appropriate ITSO.
4. Reference to relevant test reports.
5. Reference to the appropriate Maintenance, Overhaul and Repair Manuals.
6. The levels of compliance, where various levels of compliance are allowed by the ITSO.
7. List of deviations accepted in accordance with 21.610.

(b) The DDP shall be endorsed with the date and signature of the holder of the ITSO authorization, or its authorized representative.

**21.609 Obligations of holders of ITSO authorizations**

The holder of an ITSO authorization under this Subpart shall:

(a) Manufacture each article in accordance with Subpart G or Subpart F that ensures that each completed article conforms to its design data and is safe for installation;

(b) Prepare and maintain, for each model of each article for which an ITSO authorization has been issued, a current file of complete technical data and records in accordance with 21.613;

(c) Prepare, maintain and update master copies of all manuals required by the applicable airworthiness specifications for the article;

(d) Make available to users of the article and to DGCA on request those maintenance, overhaul and repair manuals necessary for the usage and maintenance of the article, and changes to those manuals;

(e) Mark each article in accordance with 21.807; and

(f) Comply with 21.3A, 21.3B and 21.4.

(g) Continue to meet the qualification requirements of 21.602B.

**21.610 Approval for deviation**

(a) Each manufacturer who requests approval to deviate from any performance standard of an ITSO shall demonstrate that the standards from which a deviation is requested are compensated for by factors or design features providing an equivalent level of safety.

(b) The request for approval to deviate, together with all pertinent data, shall be submitted to DGCA.

**21.611 Design changes**

(a) The holder of the ITSO authorization may make minor design changes (any change other than a major change) as per the procedures agreed with DGCA. In this case, the changed article keeps the original model number (part number changes or amendments shall be used to identify minor changes) and the holder shall forward to DGCA any revised data that are necessary for compliance with 21.603(b).

(b) Any design change by the holder of the ITSO authorization that is extensive enough to require a substantially complete investigation to determine compliance with an ITSO is a major change. Before making such a change, the holder shall assign a new type or model designation to the article and apply for a new authorization under 21.603.

(c) No design change by any natural or legal person other than the holder of the ITSO authorization who submitted the statement of compliance for the article is eligible for approval under this Subpart O unless the person seeking the approval applies under 21.603 for a separate ITSO authorization.

**21.613 Record keeping**

Further to the record keeping requirements appropriate to or associated with the quality system, all relevant design information, drawings and test reports, including inspection records for the article tested, shall be held at the disposal of DGCA and shall be retained in order to provide the information necessary to ensure the continued airworthiness of the article and of the type-certificated product in which it is fitted.

**21.615 Inspection by DGCA**

Upon a request of DGCA, each applicant for, or holder of an ITSO authorization for an article shall allow DGCA to:

(a) Witness any tests.

(b) Inspect the technical data files on that article.

**21.619 Duration and continued validity**

(a) An ITSO authorization shall be issued for an unlimited period. It shall remain valid unless:

1. the conditions required when ITSO authorization was granted are no longer being observed; or
2. the obligations of the holder specified in 21.609 are no longer being discharged; or
3. the article has proved to give rise to unacceptable hazards in service; or
4. the authorization has been surrendered or revoked under the applicable administrative procedures established by DGCA.

(b) Upon surrender or revocation, the certificate shall be returned to DGCA.

**21.621 Transferability**

Except for a change in ownership of the holder, which shall be regarded as a change of significance, and shall therefore comply with 21.147, 21.A247 and 21.B247 as applicable, an ITSO authorization issued under this CAR is not transferable.

# SUBPART P — SPECIAL FLIGHT PERMIT

**21.701 Scope**

(a) Special flight permit shall be issued in accordance with this Subpart to aircraft that do not meet, or have not been shown to meet, applicable airworthiness requirements but are capable of safe flight under defined conditions and for the following purposes:

1. development;
2. showing compliance with regulations or airworthiness codes;
3. design organizations or production organizations crew training;
4. production flight testing of new production aircraft;
5. flying aircraft under production between production facilities;
6. Conducting customer demonstration flights of new production aircraft that have satisfactorily completed production test flights;
7. delivering or exporting the aircraft;
8. flying the aircraft for DGCA acceptance;
9. market survey, including customer's crew training;
10. exhibition and air show;
11. flying the aircraft to a location where repair, alteration, or maintenance or airworthiness review are to be performed, or to a place of storage in case of a suspended or deemed to be suspended Certificate of Airworthiness/ Special Certificate of Airworthiness;
12. flying an aircraft at a weight in excess of its maximum certificated takeoff weight for flight beyond the normal range over water, or over land areas where adequate landing facilities or appropriate fuel is not available; The excess weight authorised under this clause shall be limited to additional fuel, fuel tanks and navigational equipment necessary for flight.
13. record breaking, air racing or similar competition;
14. flying aircraft meeting the applicable airworthiness requirements before conformity to the environmental requirements has been found;`
15. for non-commercial flying activity on individual non-complex aircraft or types for which a certificate of airworthiness or special certificate of airworthiness is not appropriate.
16. Evacuating aircraft from areas of impending danger.
17. Flights under modification or repair.

(b) This subpart establishes procedure for issuing Special Flight Permit and approving associated flight conditions, and establishes the rights and obligations of the applicants for, and holders of, those permits and approvals of flight conditions.

**21.703 Eligibility**

(a) Any natural or legal person shall be eligible as an applicant for a Special Flight Permit except for a Special Flight Permit requested for the purpose of 21.701(a)(15) where the applicant shall be the owner.

(b) Any natural or legal person shall be eligible for application for the approval of the flight conditions from DGCA.

**21.707Application for Special Flight Permit**

(a) Pursuant to 21.703, an application for a Special Flight Permit shall be made to DGCA in form CA-22.

(b) Each application for a Special Flight Permit shall include:

1. the purpose(s) of the flight(s), in accordance with 21.701;
2. the ways in which the aircraft does not comply with the applicable airworthiness requirements;
3. the flight conditions approved in accordance with 21.710.

(c) Where the flight conditions are not approved at the time of application for a Special Flight Permit, an application for approval of the flight conditions shall be made in accordance with 21.709.

**21.708 Flight conditions**

Flight conditions include:

(a) the configuration(s) for which the Special Flight Permit is requested;

(b) any condition or restriction necessary for safe operation of the aircraft, including:

1. the conditions or restrictions put on itineraries or airspace, or both, required for the flight(s);
2. the conditions and restrictions put on the flight crew to fly the aircraft;
3. the restrictions regarding carriage of persons other than flight crew;
4. the operating limitations, specific procedures or technical conditions to be met;
5. the specific flight test programme (if applicable);
6. the specific continuing airworthiness arrangements including maintenance instructions and regime under which they will be performed;

(c) the substantiation that the aircraft is capable of safe flight under the conditions or restrictions of subparagraph (b);

(d) the method used for the control of the aircraft configuration, in order to remain within the established conditions.

**21.709 Application for approval of flight conditions**

(a) Pursuant to 21.707(c), an application for approval of the flight conditions shall be made to DGCA in form CA-21;

(b) Each application for approval of the flight conditions shall include:

1. the proposed flight conditions;
2. the documentation supporting these conditions; and
3. a declaration that the aircraft is capable of safe flight under the conditions or restrictions of paragraph 21.708 (b).

**21.710 Approval of flight conditions**

(a) All the flight conditions related or not related to safety of design shall be approved by DGCA;

(b) Before approving the flight conditions, DGCA must be satisfied that the aircraft is capable of safe flight under the specified conditions and restrictions. DGCA may make or require the applicant to make any necessary inspections or tests for that purpose.

**21.711 Issue of a Special Flight Permit**

(a) DGCA shall issue a Special Flight Permit:

1. upon presentation of the data required by 21.707; and
2. when the conditions of 21.708 have been approved in accordance with 21.710; and
3. when DGCA, through its own investigations, which may include inspections, or through procedures agreed with the applicant, is satisfied that the aircraft conforms to the design defined under 21.708 before flight.

(b) (Reserved)

(c) An appropriately approved production organization may carry out a Special Flight Permit operation under the privilege granted under 21.163(e), when the conditions of 21.708 have been approved in accordance with 21.710 and under the procedures agreed with DGCA.

(d) The Special Flight Permit shall specify the purpose(s) and any conditions and restrictions approved under 21.710.

**21.713 Changes**

(a) Any change that invalidates the flight conditions or associated substantiation established for the Special Flight Permit shall be approved in accordance with 21.710. When relevant an application shall be made in accordance with 21.709.

(b) A change affecting the content of the Special Flight Permit requires the issuance of a new Special Flight Permit in accordance with 21.711.

**21.715 Language**

Placards related to public information shall be presented in bi-lingual, i.e. Hindi and English. Placards not related to public information, manuals, listings, and instrument markings and other necessary information required by applicable airworthiness codes shall be presented in English only.

**21.719 Transferability**

(a) A Special Flight Permit is not transferable.

**21.721 Inspections**

The holder of, or the applicant for, a Special Flight Permit shall provide access to the aircraft concerned at the request of DGCA

**21.723 Duration and continued validity**

(a) A Special Flight Permit shall be issued for a maximum of 12 months and shall remain valid subject to:

1. compliance with the conditions and restrictions of 21.711(d) associated to the Special Flight Permit;
2. the Special Flight Permit not being surrendered or revoked.
3. the aircraft remaining on the same register.

(b) Upon surrender or revocation, the Special Flight Permit shall be returned to DGCA

**21.725 Renewal of Special Flight Permit**

Renewal of the Special Flight Permit shall be processed as a change in accordance with 21.713.

**21.727 Obligations of the holder of a Special Flight Permit**

The holder of a Special Flight Permit shall ensure that all the conditions and restrictions associated with the Special Flight Permit are satisfied and maintained.

**21.729 Recordkeeping**

(a) All documents produced to establish and justify the flight conditions shall be held by the holder of the approved organization at the disposal of DGCA and shall be retained in order to provide the information necessary to ensure the continued airworthiness of the aircraft.

(b) All documents associated to Special Flight Permit operation including inspection records, documents supporting the approval of flight conditions and the Special Flight Permit itself, shall be held by the related approved organization at the disposal of DGCA and shall be retained in order to provide the information necessary to ensure the continued airworthiness of the aircraft.

# SUBPART Q — IDENTIFICATION OF PRODUCTS, PARTS AND APPLIANCES

**21.801 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 DGCA 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 paragraph (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 paragraph (a), and will not likely be defaced or removed during normal service or lost or destroyed in an accident.

(d) For manned balloons, the identification plate prescribed in paragraph (b) shall be secured to the balloon envelope and shall be located, if practicable, where it is legible to the operator when the balloon is inflated. In addition, the basket and any heater assembly shall be permanently and legibly marked with the manufacturer's name, part number, or equivalent, and serial number, or equivalent.

**21.803 Handling of identification data**

(a) No person shall remove, change, or place identification information referred to in 21.801(a) on any aircraft, engine, propeller, propeller blade, or propeller hub, or in 21.807(a) on an APU, without the approval of the DGCA.

(b) No person shall remove or install any identification plate referred to in 21.801, or in 21.807 for an APU, without the approval of DGCA.

(c) By way of derogation from paragraphs (a) and (b), any natural or legal person performing maintenance work under the applicable associated implementing rules may, in accordance with methods, techniques and practices established by DGCA:

1. Remove, change, or place the identification information referred to in 21.801(a) on any aircraft, engine, propeller, propeller blade, or propeller hub, or in 21.807(a) on an APU; or

2. Remove an identification plate referred to in 21.801, or 21.807 for an APU, when necessary during maintenance operations.

(d) No person shall install an identification plate removed in accordance with subparagraph (c) (2) on any aircraft, engine, propeller, propeller blade, or propeller hub other than the one from which it was removed.

**21.804 Identification of parts and appliances**

(a) Each manufacturer of a part or appliance shall permanently and legibly mark the part or appliance with:

1. a name, trademark, or symbol identifying the manufacturer in a manner identified by the applicable design data; and
2. the part number, as defined in the applicable design data; and
3. the letters 'IPA' for parts or appliances produced in accordance with approved design data not belonging to the type-certificate holder of the related product, except for ITSO articles.

(b) By way of derogation from paragraph (a), if DGCA agrees that a part or appliance is too small or that it is otherwise impractical to mark a part or appliance with any of the information required by paragraph (a), the authorized release document accompanying the part or appliance or its container shall include the information that could not be marked on the part.

**21.805 Identification of critical parts**

In addition to the requirement of 21.804, each manufacturer of a part to be fitted on a type-certificated product which has been identified as a critical part shall permanently and legibly mark that part with a part number and a serial number.

**21.807 Identification of ITSO articles**

(a) Each holder of an ITSO authorization under Subpart O shall permanently and legibly mark each article with the following information:

1. The name and address of the manufacturer;
2. The name, type, part number or model designation of the article;
3. The serial number or the date of manufacture of the article or both; and
4. The applicable ITSO number.

(b) By way of derogation from paragraph (a), if DGCA agrees that a part is too small or that it is otherwise impractical to mark a part with any of the information required by paragraph (a), the authorized release document accompanying the part or its container shall include the information that could not be marked on the part.

(c) Each person who manufactures an APU under Subpart G or Subpart F shall identify that APU by means of a fire-proof plate that has the information specified in paragraph (a) marked on it by etching, stamping, engraving or other approved method of fireproofing 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.

(Vir Vikram Yadav)
Director General of Civil Aviation

**Directorate General of Civil Aviation**

# AMC and GM to CAR 21

**Acceptable Means of Compliance and Guidance Material 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**



i

# TERMINOLOGY

For information purposes:

"Certification Specifications" (CS)/ "Federal Aviation regulations" (FAR) refers when used in the text to the airworthiness codes and associated acceptable means of compliance accepted by DGCA.

"Acceptable Means of Compliance" (AMC) illustrate a means, but not the only means, by which a specification contained in an airworthiness code or a requirement in an implementing rule can be met.

"Guidance Material" (GM) helps to illustrate the meaning of a specification or requirement.

# Subpart A – General

**GM 21.3A(a)The system for collection, investigation and analysis of data**

In the context of that requirement the word "Collection" means, the setting up, of systems and procedures which will enable relevant malfunctions, failures and defects to be properly reported when they occur.

**AMC No. 1 to 21.3A(a)Collection, investigation and analysis of data related to Flammability Reduction Means (FRM) reliability**

Holders of a type certificate, restricted type certificate, supplemental type certificate or any other relevant approval deemed to have been issued under CAR 21 and which have included a FRM in their design should assess on an ongoing basis the effects of aeroplane component failures on FRM reliability. This should be part of the system for collection, investigation and analysis of data required by 21.3A (a). The applicant/holder should do the following:

(a) Demonstrate effective means to ensure collection of FRM reliability data. The means should provide data affecting FRM reliability, such as component failures.

(b) Unless alternative reporting procedures are approved by DGCA, provide a report to the DGCA every six months for the first five years after service introduction. After that period, continued reporting every six months may be replaced with other reliability tracking methods found acceptable to the DGCA or eliminated if it is established that the reliability of the FRM meets, and will continue to meet, the exposure specifications of paragraph M25.1 of appendix M to CS25.

(c) Develop service instructions or revise the applicable aeroplane manual, according to a schedule approved by the DGCA, to correct any failures of the FRM that occur in service that could increase any fuel tank's Fleet Average Flammability Exposure to more than that specified by paragraph M25.1 of appendix M to CS25.

**AMC No. 2 to 21.3A(a) Collection, investigation and analysis of data related to ETOPS significant occurrences**

(1) Holders of a type-certificate, restricted type-certificate, supplemental type-certificate or any other relevant approval deemed to have been issued under CAR-21 and which includes extended range operation with two-engine aeroplane (ETOPS) capability should implement a specific tracking, reporting and resolution system for ETOPS significant occurrences, suitable to ensure the initial and continued fleet compliance with the applicable ETOPS reliability objectives. This system should be part of the system for collection, investigation and analysis of data required by 21.3A(a).

Appropriate coordination should exist between Engine TC holder, propeller TC holder and APU ITSO approval holder with the aircraft TC holder to ensure compliance with the ETOPS reliability objectives.

**GM 21.3A(b)Occurrence reporting**

**1. INTENT**

This GM is interpretative material and provides guidance in order to determine which occurrences should be reported to DGCA and to other organisations, and it provides guidance on the timescale for submission of such reports.

It also describes the objective of the overall occurrence reporting system including internal and external functions

**2. APPLICABILITY**

(a) This GM only applies to occurrence reporting by persons/organisations regulated by DGCA. It does not address reporting by aerodrome organisations, air navigation service providers and authorities themselves.

(b) In most cases the obligation to report is on the holders of a certificate or approval, which in most cases are organisations, but in some cases can be a single person. In addition some reporting requirements are directed to persons. However, in order not to complicate the text, only the term 'organisation' is used.

(c) The GM also does not apply to dangerous goods reporting. The definition of reportable dangerous goods occurrences is different from the other occurrences and the reporting system is also separate. This subject is covered in specific operating requirements and guidance and ICAO Documents namely:

(i) ICAO Annex 18, The Safe Transport of Dangerous Goods by Air, Chapter 12
(ii) ICAO Doc 9284-AN/905, Technical Instructions for the Safe Transport of Dangerous Goods by Air.

**3. OBJECTIVE OF OCCURRENCE REPORTING**

(a) The occurrence reporting system is an essential part of the overall monitoring function. The objective of the occurrence reporting, collection, investigation and analysis systems described in the operating rules, and the airworthiness rules is to use the reported information to contribute to the improvement of aviation safety, and not to attribute blame, impose fines or take other enforcement actions.

(b) The detailed objectives of the occurrence reporting systems are:

(i) To enable an assessment of the safety implications of each occurrence to be made, including previous similar occurrences, so that any necessary action can be initiated. This includes determining what and why it had occurred and what might prevent a similar occurrence in the future.

(ii) To ensure that knowledge of occurrences is disseminated so that other persons and organisations may learn from them.

(c) The occurrence reporting system is complementary to the normal day to day procedures and 'control' systems and is not intended to duplicate or supersede any of them. The occurrence reporting system is a tool to identify those occasions where routine procedures have failed.

(d) Occurrences should remain in the database when judged reportable by the person submitting the report as the significance of such reports may only become obvious at a later date.

## 4. REPORTING TO DGCA

(a) Requirements

(i) As detailed in the operating rules, occurrences defined as an incident, malfunction, defect, technical defect or exceedence of technical limitations that endangers or could endanger the safe operation of the aircraft must be reported to DGCA.

(ii) The products and part and appliances design rules prescribe that occurrences defined as a failure, malfunction, defect or other occurrence which has resulted in or may result in an unsafe condition must be reported to DGCA.

(iii) According to the product and part and appliances production rules occurrences defined as a deviation which could lead to an unsafe condition must be reported to DGCA.

(iv) The maintenance rules stipulate that occurrences defined as any condition of the aircraft or aircraft component that has resulted or may result in an unsafe condition that could seriously hazard the aircraft must be reported to DGCA.

(v) Reporting does not remove the reporter's or organisation's responsibility to commence corrective actions to prevent similar occurrences in the future. Known and planned preventive actions should be included within the report.

(b) Paragraph 8 (g) of this GM provides guidance as to what should be reported by an organisation to DGCA. The list of criteria provided may be used as guidance for establishing which occurrences shall be reported by which organisation. For example, the organisation responsible for the design will not need to report certain operational occurrences that it has been made aware of, if the continuing airworthiness of the product is not involved.

## 5. REPORTING TIME

(a) The period of 72 hours is normally understood to start from when the occurrence took place or from the time when the reporter determined that there was, or could have been, a potentially hazardous or unsafe condition.

(b) Within the overall limit of 72 hours for the submission of a report, the degree of urgency should be determined by the level of hazard judged to have resulted from the occurrence:

(i) Where an occurrence is judged to have resulted in an immediate and particularly significant hazard DGCA expects to be advised immediately, and by the fastest possible means (e.g. telephone, fax, telex, e-mail) of whatever details are available at that time. This initial notification should then be followed up by a report within 72 hours.

(ii) Where the occurrence is judged to have resulted in a less immediate and less significant hazard, report submission may be delayed up to the maximum of 72 hours in order to provide more details or more reliable information.

## 6. CONTENT OF REPORTS

(a) Notwithstanding other required reporting means as promulgated in applicable requirements, reports may be transmitted in any form considered acceptable to DGCA. The amount of information in the report should be commensurate with the severity of the occurrence. Each report should at least contain the following elements, as applicable to each organisation:

(i) Organisation name
(ii) Approval reference (if relevant)
(iii) Information necessary to identify the aircraft or part affected.
(iv) Date and time if relevant
(v) A written summary of the occurrence
(vi) Any other specific information required

(b) For any occurrence involving a system or component, which is monitored or protected by a warning and/or protection system (for example: fire detection/extinguishing) the occurrence report should always state whether such system(s) functioned properly.

## 7. REPORTING BETWEEN ORGANISATIONS

(a) Requirements exist that address the reporting of data relating to unsafe or un-airworthy conditions. These reporting lines are:
(i) Production Organisation to the organisation responsible for the design;
(ii) Maintenance organisation to the organisation responsible for the design;
(iii) Maintenance organisation to operator;
(iv) Operator to organisation responsible for the design;
(v) Production organisation to production organisation.

(b) The 'Organisation responsible for the design' is a general term, which can be any one or a combination of the following organizations.

(i) Holder of Type Certificate (TC) of an Aircraft, Engine or Propeller;
(ii) Holder of a Supplemental Type Certificate (STC) on an Aircraft, Engine or Propeller;
(iii) Holder of a Indian Technical Standard Order (ITSO) Authorisation; or
(iv) Holder of an Indian Part Approval (IPA).

(c) If it can be determined that the occurrence has an impact on or is related to an aircraft component which is covered by a separate design approval (TC, STC, ITSO or IPA), then the holders of such approval/authorisation should be informed. If an occurrence happens on a component which is covered by an TC, STC, ITSO

or IPA (e.g. during maintenance), then only that TC, STC, ITSO Authorisation or IPA holder needs to be informed.

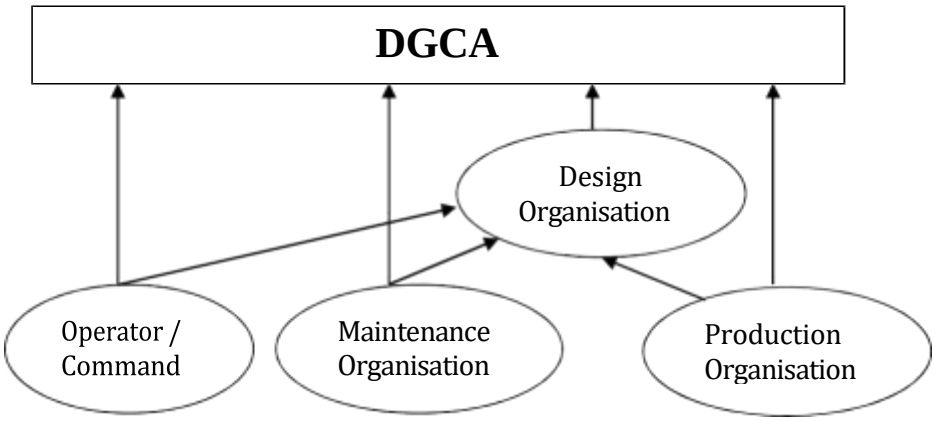
(d) The form and timescale for reports to be exchanged between organisations is left for individual organisations to determine. What is important is that a relationship exists between the organisations to ensure that there is an exchange of information relating to occurrences.

(e) Paragraph 8 (g) of this GM provides guidance as to what should be reported by an organisation to DGCA. The list of criteria provided may be used as guidance for establishing which occurrences shall be reported to which organisation. For example, certain operational occurrences will not need to be reported by an operator to the design or production organisation.

**8. REPORTABLE OCCURRENCES**

**(a) General:**

There are different reporting requirements for operators (and/or commanders), maintenance organisations, design organisations and production organisations. Moreover, as explained in paragraph 4. and 9. above, there are not only requirements for reporting to DGCA, but also for reporting to other (private) entities. The criteria for all these different reporting lines are not the same. For example DGCA will not receive the same kind of reports from a design organisation as from an operator. This is a reflection of the different perspectives of the organisations based on their activities. Figure 1 presents a simplified scheme of all reporting lines.




**(b) Operations and Maintenance*:***

The list of examples of reportable occurrences offered below under g. is established from the perspective of primary sources of occurrence information in the operational area (operators and maintenance organisations) to provide guidance for those persons developing criteria for individual organisations on what they need to report to DGCA. The list is neither definitive nor exhaustive and judgement by the reporter of the degree of hazard or potential hazard involved is essential.

**(c) Design:**

The list of examples will not be used by design organisations directly for the purpose of determining when a report has to be made to DGCA, but it can serve as guidance for the establishment of the system for collecting data. After receipt of reports from the primary sources of information, designers will normally perform some kind of analysis to determine whether an occurrence has resulted or may result in an unsafe condition and a report to DGCA should be made. An analysis method for determining when an unsafe condition exists in relation to continuing airworthiness is detailed in the GM's regarding the issuance of Airworthiness Directives.

**(d) Production:**
The list of examples is not applicable to the reporting obligation of production organisations. Their primary concern is to inform the design organisation of deviations. Only in cases where an analysis in conjunction with that design organisation shows that the deviation could lead to an unsafe condition, should a report be made to DGCA (see also c. above).

**(e) Customised list:**
Each approval, certificate, authorisation other than those mentioned in sub paragraph c and d above, should develop a customised list adapted to its aircraft, operation or product. The list of reportable occurrences applicable to an organisation is usually published within the organisation's expositions/handbooks/manuals.

**(f) Internal reporting:**
The perception of safety is central to occurrence reporting. It is for each organisation to determine what is safe and what is unsafe and to develop its reporting system on that basis. The organisation should establish an internal reporting system whereby reports are centrally collected and reviewed to establish which reports meet the criteria for occurrence reporting to DGCA and other organisations, as required.

**(g) List of examples of reportable occurrences:**
The following is a generic list. Not all examples are applicable to each reporting organisation. Therefore each organisation should define and agree with DGCA a specific list of reportable occurrences or a list of more generic criteria, tailored to its activity and scope of work (see also 8.e above). In establishing that customised list, the organisation should take into account the following considerations:

Reportable occurrences are those where the safety of operation was or could have been endangered or which could have led to an unsafe condition. If in the view of the reporter an occurrence did not hazard the safety of the operation but if repeated in different but likely circumstances would create a hazard, then a report should be made. What is judged to be reportable on one class of product, part or appliance may not be so on another and the absence or presence of a single factor, human or technical, can transform an occurrence into a serious incident or accident.

Specific operational approvals, e.g. RVSM, ETOPS, RNAV, or a design or maintenance programme, may have specific reporting requirements for failures or malfunctions associated with that approval or programme.

The organization related to TC/STC, design, changes to design, repair, ITSO, production shall take occurrence reporting related to them. The following list is

common for all Operators, Aircraft Maintenance Organisations, Design Organisations and Production Organisations.

CONTENTS:
I. AIRCRAFT FLIGHT OPERATIONS
II. AIRCRAFT TECHNICAL

## I. AIRCRAFT FLIGHT OPERATIONS

### A. Operation of the Aircraft

(1) (a) Risk of collision with an aircraft, terrain or other object or an unsafe situation when avoidance action would have been appropriate.

(b) An avoidance manoeuvre required to avoid a collision with an aircraft, terrain or other object.

(c) An avoidance manoeuvre to avoid other unsafe situations.

(2) Take-off or landing incidents, including precautionary or forced landings. Incidents such as under-shooting, overrunning or running off the side of runways. Take-offs, rejected take-offs, landings or attempted landings on a closed, occupied or incorrect runway. Runway incursions.

(3) Inability to achieve predicted performance during take-off or initial climb.

(4) Critically low fuel quantity or inability to transfer fuel or use total quantity of usable fuel.

(5) Loss of control (including partial or temporary loss of control) from any cause.

(6) Occurrences close to or above V1 resulting from or producing a hazardous or potentially hazardous situation (e.g. rejected take-off, tail strike, engine power loss etc.).

(7) Go-around producing a hazardous or potentially hazardous situation.

(8) Unintentional significant deviation from airspeed, intended track or altitude. (more than 91 m (300 ft)) from any cause.

(9) Descent below decision height/altitude or minimum descent height/altitude without the required visual reference.

(10) Loss of position awareness relative to actual position or to other aircraft.

(11) Breakdown in communication between flight crew (CRM) or between Flight crew and other parties (cabin crew, ATC, engineering).

(12) Heavy landing - a landing deemed to require a 'heavy landing check'.

(13) Exceedance of fuel imbalance limits.

(14) Incorrect setting of an SSR code or of an altimeter subscale.

(15) Incorrect programming of, or erroneous entries into, equipment used for navigation or performance calculations, or use of incorrect data.

(16) Incorrect receipt or interpretation of radiotelephony messages.

(17) Fuel system malfunctions or defects, which had an effect on fuel supply and/or distribution.

(18) Aircraft unintentionally departing a paved surface.

(19) Collision between an aircraft and any other aircraft, vehicle or other ground object.

(20) Inadvertent and/or incorrect operation of any controls.

(21) Inability to achieve the intended aircraft configuration for any flight phase (e.g. landing gear and doors, flaps, stabilisers, slats etc).

(22) A hazard or potential hazard which arises as a consequence of any deliberate simulation of failure conditions for training, system checks or training purposes.

(23) Abnormal vibration.

(24) Operation of any primary warning system associated with manoeuvrings of the aircraft e.g. configuration warning, stall warning (stick shake), over speed warning etc. unless:
   (a) the crew conclusively established that the indication was false. Provided that the false warning did not result in difficulty or hazard arising from the crew response to the warning; or
   (b) operated for training or test purposes.

(25) GPWS/TAWS 'warning' when:

   (a) the aircraft comes into closer proximity to the ground than had been planned or anticipated; or
   (b) the warning is experienced in IMC or at night and is established as having been triggered by a high rate of descent (Mode 1); or
   (c) the warning results from failure to select landing gear or land flap by the appropriate point on the approach (Mode 4); or
   (d) any difficulty or hazard arises or might have arisen as a result of crew response to the 'warning' e.g. possible reduced separation from other traffic. This could include warning of any Mode or Type i.e. genuine, nuisance or false.

(26) GPWS/TAWS 'alert' when any difficulty or hazard arises or might have arisen as a result of crew response to the 'alert'.

(27) ACAS RAs.

(28) Jet or prop blast incidents resulting in significant damage or serious injury.

**B. Emergencies**

(1) Fire, explosion, smoke or toxic or noxious fumes, even though fires were extinguished.

(2) The use of any non-standard procedure by the flight or cabin crew to deal with an emergency when:

(a) the procedure exists but is not used; or
(b) a procedure does not exist; or
(c) the procedure exists but is incomplete or inappropriate; or
(d) the procedure is incorrect; or
(e) the incorrect procedure is used.

(3) Inadequacy of any procedures designed to be used in an emergency, including when being used for maintenance, training or test purposes.

(4) An event leading to an emergency evacuation.

(5) Depressurisation.

(6) The use of any emergency equipment or prescribed emergency procedures in order to deal with a situation.

(7) An event leading to the declaration of an emergency.

(8) Failure of any emergency system or equipment, including all exit doors and lighting, to perform satisfactorily, including when being used for maintenance, training or test purposes.

(9) Events requiring any emergency use of oxygen by any crew member.

**C. Crew Incapacitation**

(1) Incapacitation of any member of the flight crew, including that which occurs prior to departure if it is considered that it could have resulted in incapacitation after take-off.

(2) Incapacitation of any member of the cabin crew which renders them unable to perform essential emergency duties.

**D. Injury**

(1) Occurrences, which have or could have led to significant injury to passengers or crew but which are not considered reportable as an accident.

**E. Meteorology**

(1) A lightning strike which resulted in damage to the aircraft or loss or malfunction of any essential service.

(2) A hail strike which resulted in damage to the aircraft or loss or malfunction of any essential service.

(3) Severe turbulence encounter – an encounter resulting in injury to occupants or deemed to require a 'turbulence check' of the aircraft.

(4) A wind shear encounter.

(5) Icing encounter resulting in handling difficulties, damage to the aircraft or loss or malfunction of any essential service.

**F. Security**

(1) Unlawful interference with the aircraft including a bomb threat or hijack.

(2) Difficulty in controlling intoxicated, violent or unruly passengers.

(3) Discovery of a stowaway.

**G. Other Occurrences**

(1) Repetitive instances of a specific type of occurrence which in isolation would not be considered 'reportable' but which due to the frequency at which they arise, form a potential hazard.

(2) A bird strike which resulted in damage to the aircraft or loss or malfunction of any essential service.

(3) Wake turbulence encounters.

(4) Any other occurrence of any type considered to have endangered or which might have endangered the aircraft or its occupants on board the aircraft or on the ground.

## II. AIRCRAFT TECHNICAL

**A. Structural**

Not all structural failures need to be reported. Engineering judgement is required to decide whether a failure is serious enough to be reported. The following examples can be taken into consideration:

(1) Damage to a Principal Structural Element that has not been qualified as damage tolerant (life limited element). Principal Structural Elements are those which

contribute significantly to carrying flight, ground, and pressurisation loads, and whose failure could result in a catastrophic failure of the aircraft. Typical examples of such elements are listed for large aeroplanes in CS/FAR 25.571(a) "damage tolerance and fatigue evaluation of structure", and in the applicable airworthiness requirements for rotorcraft.

(2) Defect or damage exceeding admissible damages to a Principal Structural Element that has been qualified as damage tolerant.

(3) Damage to or defect exceeding allowed tolerances of a structural element which failure could reduce the structural stiffness to such an extent that the required flutter, divergence or control reversal margins are no longer achieved.

(4) Damage to or defect of a structural element, which could result in the liberation of items of mass that may injure occupants of the aircraft.

(5) Damage to or defect of a structural element, which could jeopardise proper operation of systems. See paragraph II.B. below.

(6) Loss of any part of the aircraft structure in flight.

**B. Systems**

The following generic criteria applicable to all systems are proposed:

(1) Loss, significant malfunction or defect of any system, subsystem or set of equipment when standard operating procedures, drills etc. could not be satisfactorily accomplished.

(2) Inability of the crew to control the system, e.g.:

(a) uncommanded actions;
(b) incorrect and or incomplete response, including limitation of movement or stiffness;
(c) runaway;
(d) mechanical disconnection or failure.

(3) Failure or malfunction of the exclusive function(s) of the system (one system could integrate several functions).

(4) Interference within or between systems.

(5) Failure or malfunction of the protection device or emergency system associated with the system.

(6) Loss of redundancy of the system.

(7) Any occurrence resulting from unforeseen behaviour of a system.

(8) For aircraft types with single main systems, subsystems or sets of equipment:

Loss, significant malfunctions or defect in any main system, subsystem or set of equipment.

(9) For aircraft types with multiple independent main systems, subsystems or sets of equipment: The loss, significant malfunction or defect of more than one main system, subsystem or set of equipment.

(10) Operation of any primary warning system associated with aircraft systems or equipment unless the crew conclusively established that the indication was false provided that the false warning did not result in difficulty or hazard arising from the crew response to the warning.

(11) Leakage of hydraulic fluids, fuel, oil or other fluids which resulted in a fire hazard or possible hazardous contamination of aircraft structure, systems or equipment, or risk to occupants.

(12) Malfunction or defect of any indication system when this results in the possibility of misleading indications to the crew.

(13) Any failure, malfunction or defect if it occurs at a critical phase of flight and relevant to the operation of that system.

(14) Occurrences of significant shortfall of the actual performances compared to the approved performance which resulted in a hazardous situation (taking into account the accuracy of the performance calculation method) including braking action, fuel consumption etc.

(15) Asymmetry of flight controls; e.g. flaps, slats, spoilers etc.

Annex 1 to this GM gives a list of examples of reportable occurrences resulting from the application of these generic criteria to specific systems

**C. Propulsion (including Engines, Propellers and Rotor Systems) and APUs**

(1) Flameout, shutdown or malfunction of any engine.

(2) Overspeed or inability to control the speed of any high speed rotating component (for example: Auxiliary power unit, air starter, air cycle machine, air turbine motor, propeller or rotor).

(3) Failure or malfunction of any part of an engine or powerplant resulting in any one or more of the following:

(a) non containment of components/debris;

(b) uncontrolled internal or external fire, or hot gas breakout;

(c) thrust in a different direction from that demanded by the pilot;

(d) thrust reversing system failing to operate or operating inadvertently;

(e) inability to control power, thrust or rpm;

(f) failure of the engine mount structure;

(g) partial or complete loss of a major part of the power plant;

(h) Dense visible fumes or concentrations of toxic products sufficient to incapacitate crew or passengers;

(i) inability, by use of normal procedures, to shutdown an engine;

(j) inability to restart a serviceable engine.

(4) An uncommanded thrust/power loss, change or oscillation which is classified as a loss of thrust or power control (LOTC).

(a) for a single engine aircraft; or
(b) where it is considered excessive for the application, or
(c) where this could affect more than one engine in a multi-engine aircraft, particularly in the case of a twin engine aircraft; or
(d) for a multi engine aircraft where the same, or similar, engine type is used in an application where the event would be considered hazardous or critical.

(5) Any defect in a life controlled part causing retirement before completion of its full life.

(6) Defects of common origin which could cause an in flight shut down rate so high that there is the possibility of more than one engine being shut down on the same flight.

(7) An engine limiter or control device failing to operate when required or operating inadvertently.

(8) exceedance of engine parameters.

(9) FOD resulting in damage.

**Propellers and -transmission**

(10) Failure or malfunction of any part of a propeller or powerplant resulting in any one or more of the following:

(a) an overspeed of the propeller;
(b) the development of excessive drag;
(c) a thrust in the opposite direction to that commanded by the pilot;
(d) a release of the propeller or any major portion of the propeller;
(e) a failure that results in excessive unbalance;

(f) the unintended movement of the propeller blades below the established minimum in-flight low-pitch position;

(g) an inability to feather the propeller;

(h) an inability to command a change in propeller pitch;

(i) an uncommanded change in pitch;

(j) an uncontrollable torque or speed fluctuation;

(k) The release of low energy parts.

**Rotors and -transmission**

(11) Damage or defect of main rotor gearbox / attachment which could lead to in flight separation of the rotor assembly, and /or malfunctions of the rotor control.

(12) Damage to tail rotor, transmission and equivalent systems.

**APUs**

(13) Shut down or failure when the APU is required to be available by operational requirements, e.g. ETOPS, MEL.

(14) Inability to shut down the APU.

(15) Overspeed.

(16) Inability to start the APU when needed for operational reasons.

**D. Human Factors**

(1) Any incident where any feature or inadequacy of the aircraft design could have led to an error of use that could contribute to a hazardous or catastrophic effect.

**E. Other Occurrences**

(1) Any incident where any feature or inadequacy of the aircraft design could have led to an error of use that could contribute to a hazardous or catastrophic effect.

(2) An occurrence not normally considered as reportable (for example, furnishing and cabin equipment, water systems), where the circumstances resulted in endangering of the aircraft or its occupants.

(3) A fire, explosion, smoke or toxic or noxious fumes.

(4) Any other event which could hazard the aircraft, or affect the safety of the occupants of the aircraft, or people or property in the vicinity of the aircraft or on the ground.

(5) Failure or defect of passenger address system resulting in loss or inaudible passenger address system.

(6) Loss of pilot's seat control during flight.

**Annex 1 to GM 21.3A(b)**

**Reportable occurrences to specific systems**

The following subparagraphs give examples of reportable occurrences resulting from the application of the generic criteria to specific systems listed in paragraph 8(g) II.B of this GM.

1. **Air conditioning/ventilation**

(a) complete loss of avionics cooling

(b) depressurization

2. **Autoflight system**

(a) failure of the autoflight system to achieve the intended operation while engaged

(b) significant reported crew difficulty to control the aircraft linked to autoflight system functioning

(c) failure of any autoflight system disconnect device

(d) Uncommanded autoflight mode change

3. **Communications**

(a) failure or defect of passenger address system resulting in loss or inaudible passenger address

(b) total loss of communication in flight

4. **Electrical system**

(a) loss of one electrical system distribution system ( AC or DC)

(b) total loss or loss or more than one electrical generation system

(c) failure of the back up ( emergency ) electrical generating system

5. **Cockpit/Cabin/Cargo**

(a) pilot seat control loss during flight

(b) failure of any emergency system or equipment, including emergency evacuation signalling system , all exit doors , emergency lighting, etc

(c) loss of retention capability of the cargo loading system

6. **Fire protection system**

(a) fire warnings, except those immediately confirmed as false

(b) undetected failure or defect of fire/smoke detection/protection system, which could lead to loss or reduced fire detection/protection

(c) absence of warning in case of actual fire or smoke

7. **Flight controls**

(a) Asymmetry of flaps, slats, spoilers etc.

(b) limitation of movement, stiffness or poor or delayed response in the operation of primary flight control systems or their associated tab and lock systems

(c) flight control surface run away

(d) flight control surface vibration felt by the crew

(e) mechanical flight control disconnection or failure

(f) significant interference with normal control of the aircraft or degradation of flying qualities

8. **Fuel system**

(a) fuel quantity indicating system malfunction resulting in total loss or erroneous indicated fuel quantity on board

(b) leakage of fuel which resulted in major loss, fire hazard , significant contamination

(c) malfunction or defects of the fuel jettisoning system which resulted in inadvertent loss of significant quantity, fire hazard, hazardous contamination of aircraft equipment or inability to jettison fuel

(d) fuel system malfunctions or defects which had a significant effect on fuel supply and/or distribution

(e) inability to transfer or use total quantity of usable fuel

9. **Hydraulics**

(a) loss of one hydraulic system ( ETOPS only)

(b) failure of the isolation system to operate

(c) loss of more than one hydraulic circuit

(d) failure of the back up hydraulic system

(e) inadvertent Ram Air Turbine extension

10. **Ice detection/protection system**

(a) undetected loss or reduced performance of the anti-ice/de-ice system

(b) loss of more than one of the probe heating systems

(c) inability to obtain symmetrical wing de icing

(d) abnormal ice accumulation leading to significant effects on performance or handling qualities

(e) crew vision significantly affected

11. **Indicating/warning/recording systems**

(a) malfunction or defect of any indicating system when the possibility of significant misleading indications to the crew could result in an inappropriate crew action on an essential system

(b) loss of a red warning function on a system

(c) for glass cockpits: loss or malfunction of more than one display unit or computer involved in the display/warning function

12. **Landing gear system /brakes/tires**

(a) brake fire

(b) significant loss of braking action

(c) unsymmetrical braking leading to significant path deviation

(d) failure of the L/G free fall extension system ( including during scheduled tests)

(e) unwanted gear or gear doors extension/retraction

(f) multiple tires burst

13. **Navigation systems (including precision approaches system) and air data systems**

(a) total loss or multiple navigation equipment failures

(b) total failure or multiple air data system equipment failures

(c) significant misleading indication

(d) Significant navigation errors attributed to incorrect data or a database coding error

(e) Unexpected deviations in lateral or vertical path not caused by pilot input.

(f) Problems with ground navigational facilities leading to significant navigation errors not associated with transitions from inertial navigation mode to radio navigation mode.

14. **Oxygen**

(a) for pressurised aircraft: loss of oxygen supply in the cockpit

(b) loss of oxygen supply to a significant number of passengers ( more than 10%), including when found during maintenance or training or test purposes

15. **Bleed air system**

(a) hot bleed air leak resulting in fire warning or structural damage

(b) loss of all bleed air systems

(c) failure of bleed air leak detection system

**AMC 21.3A(b)(2)Reporting to DGCA**

Within the overall limit of 72 hours the degree of urgency for submission of a report should be determined by the level of hazard judged to have resulted from the occurrence.

Where an occurrence is judged by the person identifying the possible unsafe condition to have resulted in an immediate and particularly significant hazard, DGCA expects to be advised immediately and by the fastest possible means (telephone, fax, email, telex, etc.) of whatever details are available at that time. This initial report must be followed up by a full written report within 72 hours. A typical example would be an uncontained engine failure resulting in damage to aircraft primary structure.

Where the occurrence is judged to have resulted in a less immediate and less significant hazard, report submission may be delayed up to the maximum of three days in order to provide more details.

**GM 21.3B(d)(4)Defect correction – Sufficiency of proposed corrective action**

This GM provides guidelines to assist in establishing rectification campaigns to remedy discovered defects.

**1. STATUS**

This document contains GM of a general nature for use in conjunction with engineering judgement, to aid airworthiness engineers in reaching decisions in the state of technology at the material time.

While the main principles of this GM could be applied to small private aeroplanes, helicopters, etc. the numerical values chosen for illustration are appropriate to large aeroplanes for public transport.

## 2. INTRODUCTION

**2.1** Over the years, target airworthiness risk levels underlying airworthiness requirements have developed on the basis of traditional qualitative airworthiness approaches; they have been given more precision in recent years by being compared with achieved airworthiness levels (judged from accident statistics) and by the general deliberations and discussions which accompanied the introduction of rational performance requirements, and more recently, the Safety Assessment approach in requirements. Although the target airworthiness risk level tends to be discussed as a single figure (a fatal accident rate for airworthiness reasons of not more than 1 in 10,000,000 flights/flying hours for large aeroplanes) it has to be recognised that the requirements when applied to particular aircraft types will result in achieved airworthiness levels at certification lying within a band around the target level and that thereafter, for particular aircraft types and for particular aircraft, the achieved level will vary within that band from time to time.

**2.2** The achieved airworthiness risk levels can vary so as to be below the target levels, because it is difficult if not impossible to design to the minimum requirements without being in excess of requirements in many areas; also because aircraft are not always operated at the critical conditions (e.g., aircraft weight, cg position and operational speeds; environmental conditions - temperature, humidity, degree of turbulence). The achieved level may vary so as to be above the target level because of undetected variations in material standards or build standards, because of design deficiencies, because of encountering unforeseen combinations of failures and/or combinations of events, and because of unanticipated operating conditions or environmental conditions.

**2.3** There is now a recognition of the need to attempt to monitor the conditions which tend to increase the level and to take appropriate corrective action when the monitoring indicates the need to do so in order to prevent the level rising above a predetermined "ceiling".

**2.4** DGCA also has a duty in terms of providing the public with aviation services and therefore should consider the penalties associated with curtailment or even removal (by "grounding") of aviation services when establishing the acceptability of any potential variation in airworthiness level.

**2.5** Thus, the purpose of this GM is:

(a) To postulate basic principles which should be used to guide the course of actions to be followed so as to maintain an adequate level of airworthiness risk after a defect has occurred which, if uncorrected, would involve a potential significant increase of the level of risk for an aircraft type.

(b) For those cases where it is not possible fully and immediately to restore an adequate level of airworthiness risk by any possible alleviating action such as an inspection or limitation, to state the criteria which should be used in order to assess the residual increase in risk and to limit it to an appropriate small fraction of the mean airworthiness through life risk.

## 3. DISCUSSION

**3.1** Several parameters are involved in decisions on safety matters. In the past the cost of proposed action has often been compared with the notional 'risk cost', i.e. the cost of a catastrophe multiplied by its probability of occurrence.

**3.2** This can be a useful exercise, but it should be held within the constraint of acceptable airworthiness risk levels, i.e., within airworthiness risk targets which represent the maximum levels of risk with which an aircraft design must comply, i.e., in the upper part of the 'band'. Currently for large aeroplanes the mean airworthiness risk level is set at a catastrophe rate for airworthiness reasons of not more than one in every ten- million flights/flying hours. The constraint is overriding in that any option, which could be permitted on risk cost considerations, or other grounds, is unacceptable if it leads to significant long-term violation of this safety requirement.

**3.3** While it should clearly be the objective of all to react to and eliminate emergency situations, i.e., those involving a potentially significant increase of airworthiness risk levels, without unreasonable delay, DGCA should be able finally to rule on what is a minimum acceptable campaign programme. It has therefore seemed desirable to devise guidelines to be used in judging whether a proposed campaign of corrective actions is sufficient in airworthiness terms, and clearly this ought to be based on determining the summation of the achieved airworthiness risk levels for the aircraft and passengers during any periods of corrective action and comparing them with some agreed target.

**3.4** As the period of corrective action will not be instantaneous (unless by grounding), there is potentially an increase in the achieved airworthiness risk level possibly to and, without controls, even above the higher part of the 'band', and the amount by which the level is above the mean target figure, and the period for which it should be allowed to continue, has been a matter of some arbitrary judgement.

**3.5** It would appear desirable to try to rationalise this judgement. For example, if an aircraft were to spend 10% of its life at a level such that the risk of catastrophe was increased by an order of magnitude, the average rate over its whole life would be doubled which may not be in the public interest. A more suitable criterion is perhaps one which would allow an average increase in risk

of, say one third on top of the basic design risk when spread over the whole life of the aircraft an amount which would probably be acceptable within the concept (See Figure 1). It would then be possible to regard the 'through life' risk to an aircraft - e.g., a mean airworthiness target of not more than one airworthiness catastrophe per 10 millions ($10^7$) hours, as made up of two parts, the first being 3/4 of the total and catering for the basic design risk and the other being 1/4 of the total, forming an allowance to be used during the individual aircraft's whole life for unforeseen campaign situations such as described above.

**3.6** Investigation has shown that a total of ten such occasions might arise during the life of an individual aircraft.

**3.7** Using these criteria, there could then be during each of these emergency periods (assumed to be ten in number) a risk allowance contributed by the campaign alone of:

$1 \times 10^{-7}$ for 2.5% of the aircraft's life; or
$5 \times 10^{-7}$ for 0.5% of the aircraft's life; or
$1 \times 10^{-6}$ for 0.25% of the aircraft's life; or
$1 \times 10^{-5}$ for 0.025% of the aircraft's life, etc.

Without exceeding the agreed 'allowance' set -aside for this purpose.

**3.8** Thus a 'reaction table' can be created as indicated in Table 1 (the last two columns assuming a typical aircraft design life of 60,000 hours and an annual utilisation of 3000 hours per annum) showing the flying or calendar time within which a defect should be corrected if the suggested targets are to be met.

Table 1

| Estimated catastrophe rate to aircraft due to the defect under consideration (per a/c hour) | Average reaction time for aircraft at risk (hours) | On a calendar basis |
|---|---|---|
| $4 \times 10^{-8}$ | 3750 | 15 months |
| $5 \times 10^{-8}$ | 3000 | 12 months |
| $1 \times 10^{-7}$ | 1500 | 6 months |
| $2 \times 10^{-7}$ | 750 | 3 months |
| $5 \times 10^{-7}$ | 300 | 6 weeks |
| $1 \times 10^{-6}$ | 150 | 3 weeks |
| $1 \times 10^{-5}$ | 15 | Return to base |

**3.9** These principles may be applied to a single aircraft or a number of aircraft of a fleet but in calculating risk, all the risk should be attributed to those aircraft which may carry it, and should not be diluted by including other aircraft in the fleet which are known to be free of risk. (It is permissible to spread the risk over the whole fleet when a source is known to exist without knowing where). Where a fleet of aircraft is involved Column 2 may be interpreted as the mean time to rectification and not the time to the last one.

**3.10** There is one further constraint. However little effect a situation may have on the 'whole life' risk of an aircraft, the risk should not be allowed to reach too high a level for any given flight. Thus while a very high risk could be tolerated for a very short period without unacceptable degradation of the overall airworthiness target, the few flights involved would be exposed to a quite unacceptable level of risk. It is therefore proposed that the Table 1 should have a cut-off at the $2 \times 10^{-6}$ level so that no flight carries a risk greater than 20 times the target. At this level the defect is beginning to contribute to a greater likelihood of catastrophe than that from all other causes, including non-airworthiness causes, put together. If the situation is worse than this, grounding appears to be the only alternative with possibly specially authorised high-risk ferry flights to allow the aircraft to return to base empty. Figures 2 and 3 show a visualisation chart equivalent to Table 1, giving average rectification time (either in flight hours or months) based on probability of defect that must be corrected.

**3.11** It will be seen that the above suggestions imply a probability of catastrophe from the campaign alone of 1.5/10,000 per aircraft during each separate campaign period (i.e., p = 0.015 per 100 aircraft fleet).

**3.12** In addition, in order to take into account large fleet size effect, the expected probability of the catastrophic event during the rectification period on the affected fleet shall not exceed 0.1. See Figure 4.

**3.13** It should also be noted that in assessing campaign risks against 'design risk', an element of conservatism is introduced, since the passenger knows only 'total risk' (i.e. airworthiness plus operations risks) and the fatal accident rate for all reasons is an order of magnitude greater than that for airworthiness reasons only (i.e., $10^{-6}$ as against $10^{-7}$). The summated campaign risk allowance proposed by this GM is therefore quite a small proportion of the total risk to which a passenger is subject. When operating for short periods at the limit of risk proposed ($2 \times 10^{-6}$ per hour) the defect is however contributing 100% more risk than all other causes added together.

**3.14** A similar approach is proposed to cover the case of defects associated to hazardous failure conditions for which the safety objectives defined by the applicable airworthiness requirements are not met. According to CS 25.1309/FAR 25.1309, the allowable probability for each hazardous failure condition is set at $10^{-7}$ per flight hour compared to $10^{-9}$ per flight hour for a catastrophic failure condition. Figure 5 is showing a visualisation chart giving average rectification time based on probability of defect that should be corrected. This is similar to figure 2 but with lower and upper boundaries adapted to cover the case of hazardous failure conditions (probabilities of $10^{-7}$ and $2 \times 10^{-4}$ respectively).

**3.15** In addition, in order to take into account large fleet size effect, the expected probability of the hazardous event during the rectification period on the affected fleet shall not exceed 0.5. See Figure 6.

## 4. GUIDELINES

**4.1** The above would lead to the following guidelines for a rectification campaign to remedy a discovered defect associated to a catastrophic failure condition without grounding the aircraft:

(i) Establish all possible alleviating actions such as inspections, crew drills, route restrictions, and other limitations.

(ii) Identify that part of the fleet, which is exposed to the residual risk, after compliance has been established with paragraph (i).

(iii) Using reasonably cautious assumptions, calculate the likely catastrophic rate for each aircraft carrying the risk in the affected fleet.

(iv) Compare the speed with which any suggested campaign will correct the deficiency with the time suggested in Figure 2. The figure should not be used beyond the $2x10^{-6}$ level, except for specially authorised flights.

(v) Also ensure that the expected probability of the catastrophic event during the rectification period on the affected fleet is in accordance with Figure 4.

**4.2** Similarly, the following guidelines would be applicable for a rectification campaign to remedy a discovered defect associated to a hazardous failure condition without grounding the aircraft:

(i) Establish all possible alleviating actions such as inspections, crew drills, route restrictions, and other limitations.

(ii) Identify that part of the fleet, which is exposed to the residual risk, after compliance has been established with paragraph (i).

(iii) Using reasonably cautious assumptions, calculate the likely hazardous rate for each aircraft carrying the risk in the affected fleet.

(iv) Compare the speed with which any suggested campaign will correct the deficiency with the time suggested in Figure 5.

(v) Also ensure that the expected probability of the hazardous event during the rectification period on the affected fleet is in accordance with Figure 6.

**4.3** It must be stressed that the benefit of these guidelines will be to form a datum for what is considered to be the theoretically maximum reaction time. A considerable amount of judgement will still be necessary in establishing many of the input factors and the final decision may still need to be tempered by non-numerical considerations, but the method proposed will at least provide a rational 'departure point' for any exercise of such judgement.

**4.4** It is not intended that the method should be used to avoid quicker reaction times where these can be accommodated without high expense or disruption of services.

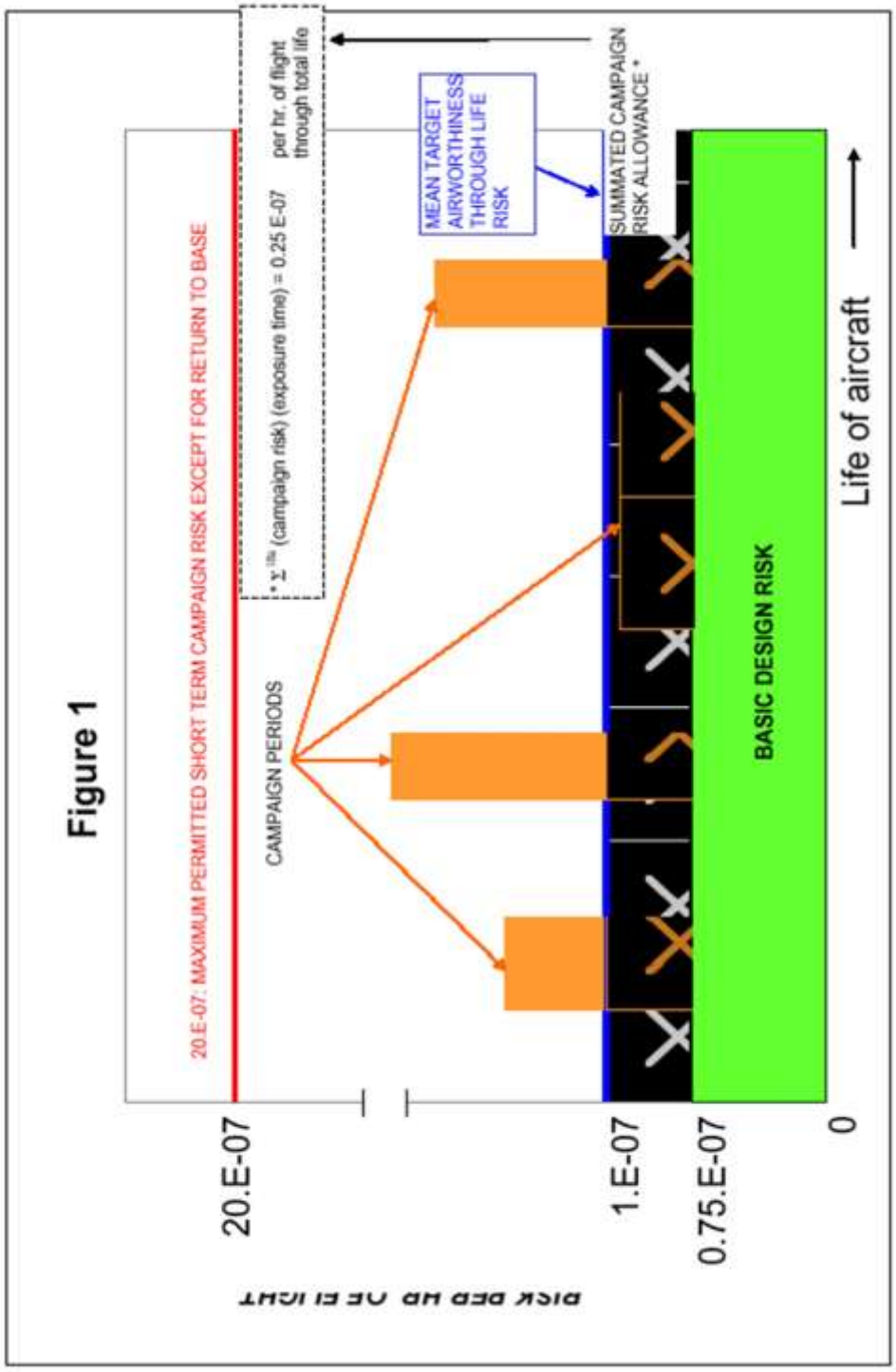


Figure 1
20.E-07: MAXIMUM PERMITTED SHORT TERM CAMPAIGN RISK EXCEPT FOR RETURN TO BASE
CAMPAIGN PERIODS
* Σ (campaign risk) (exposure time) = 0.25 E-07 per hr. of flight through total life
MEAN TARGET AIRWORTHINESS THROUGH LIFE RISK
SUMMATED CAMPAIGN RISK ALLOWANCE *
BASIC DESIGN RISK
Life of aircraft
20.E-07
1.E-07
0.75.E-07
0

**Figure 2 - Visualisation Chart for CS-25 (Flight hours)**

Assumptions: - aircraft life of 60,000 hours
- 10 'catastrophic events' campaigns

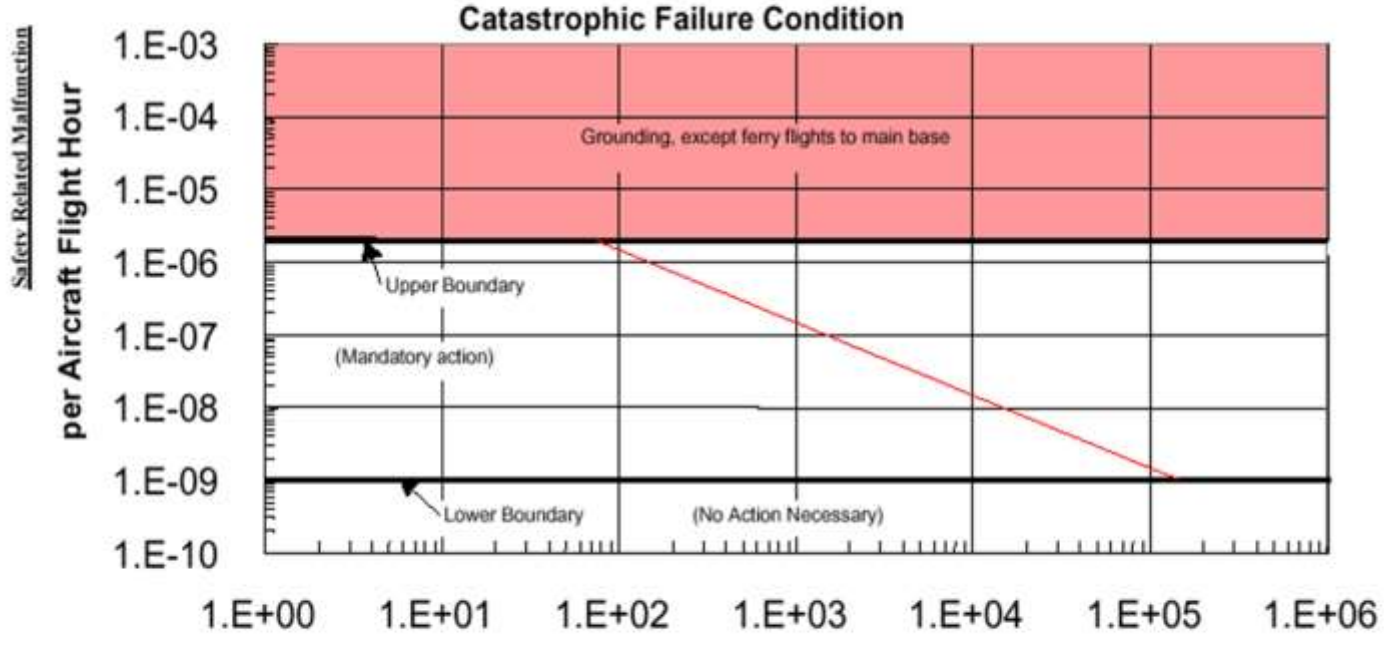
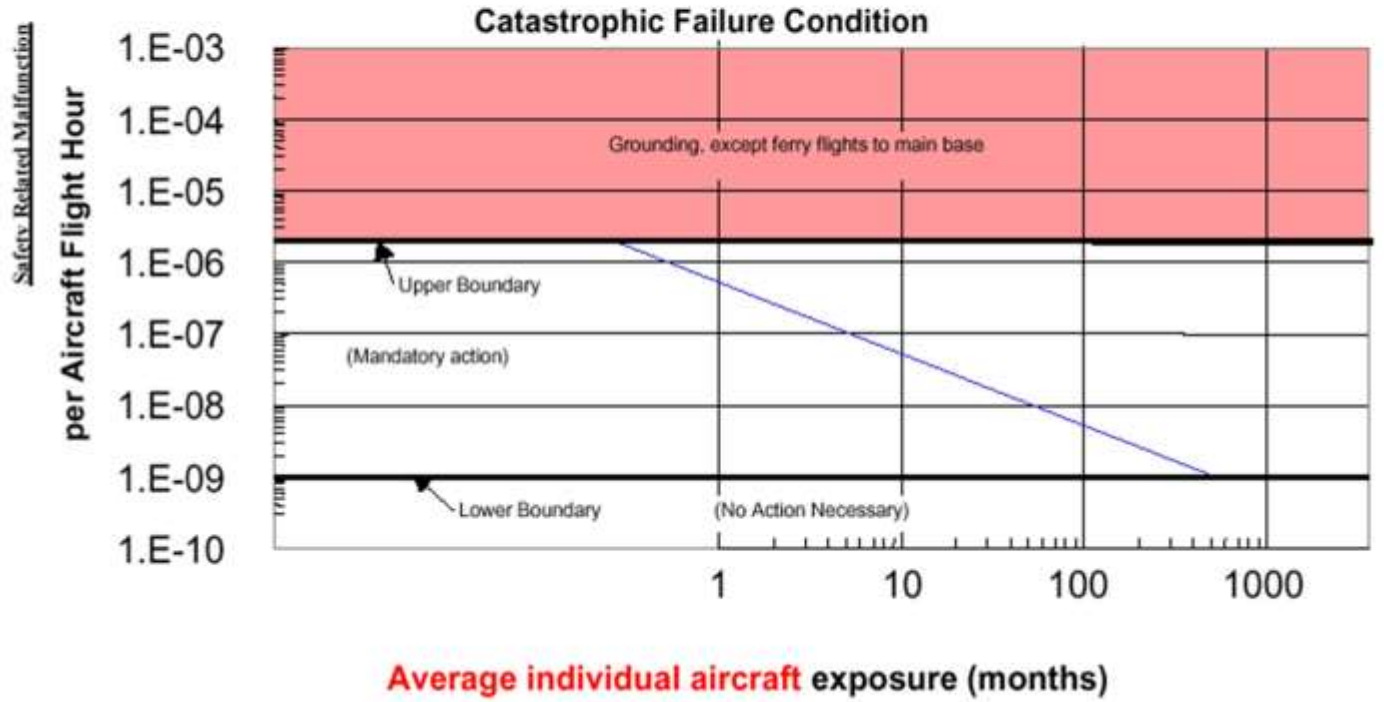


**Figure 3 - Visualisation Chart for CS-25 (Calendar basis)**

**Assumptions: - aircraft life of 60,000 hours, 3000 hours per year**
**- 10 'catastrophic events' campaigns**



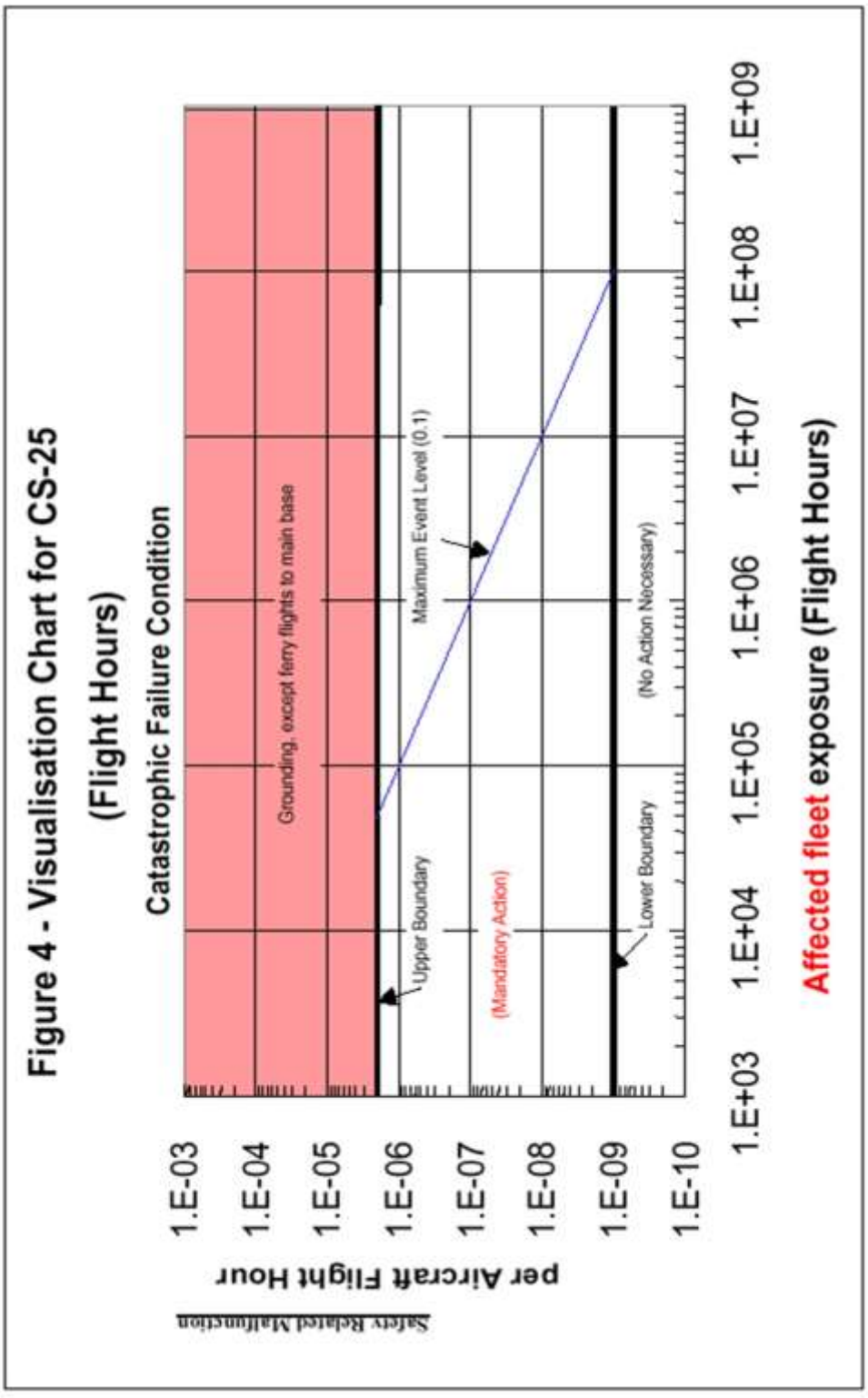
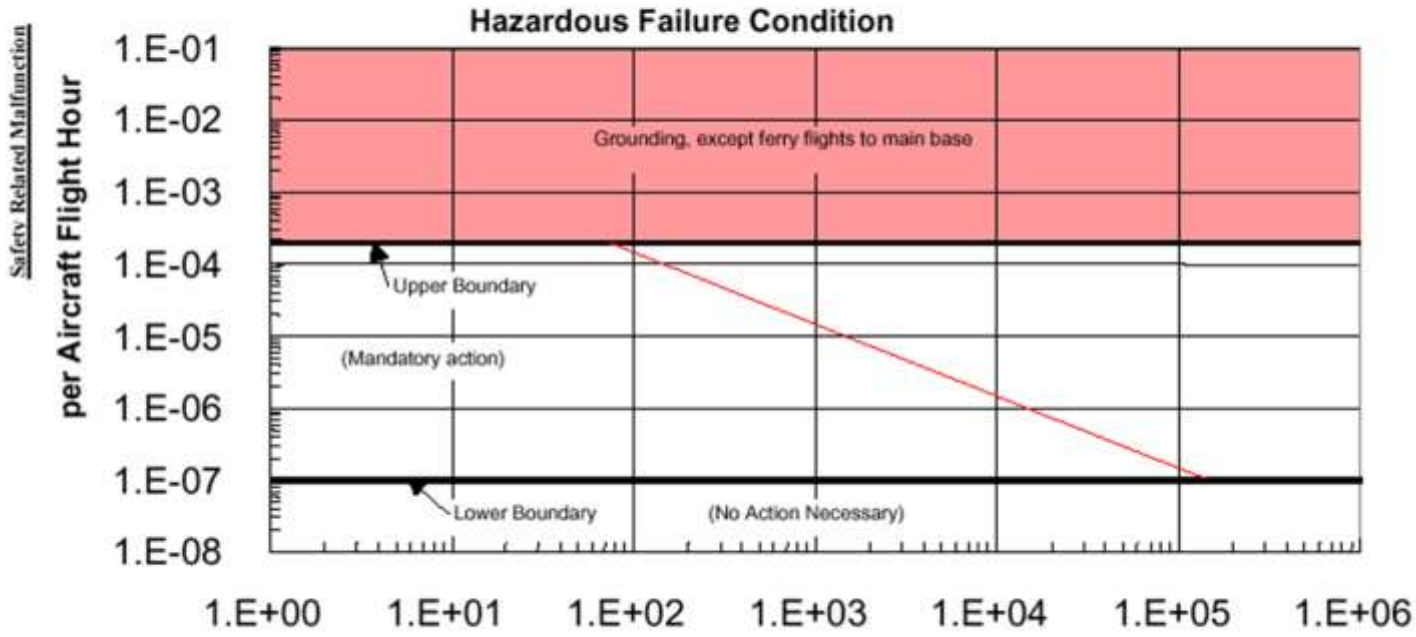


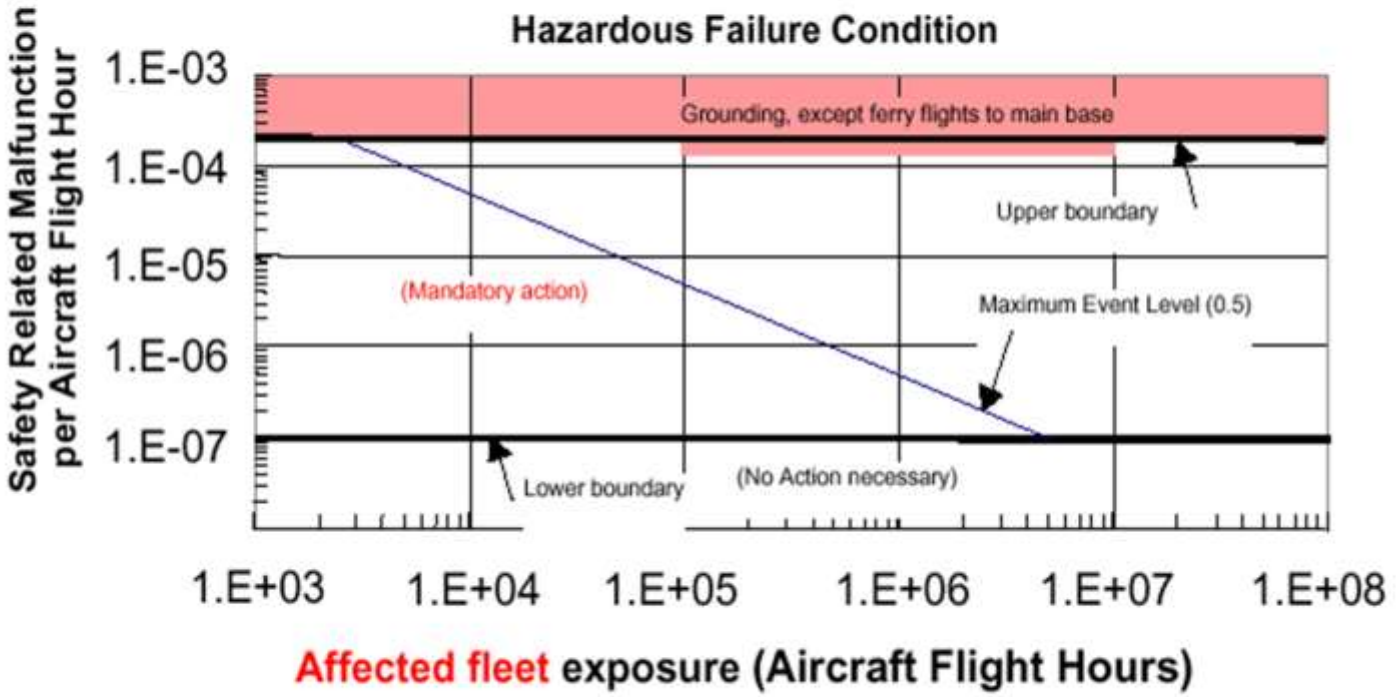
Figure 4 - Visualisation Chart for CS-25
(Flight Hours)
Catastrophic Failure Condition
Grounding, except ferry flights to main base
Maximum Event Level (0.1)
Upper Boundary
(Mandatory Action)
Lower Boundary
(No Action Necessary)
Safety Related Malfunction
per Aircraft Flight Hour
1.E-03
1.E-04
1.E-05
1.E-06
1.E-07
1.E-08
1.E-09
1.E-10
1.E+03
1.E+04
1.E+05
1.E+06
1.E+07
1.E+08
1.E+09
Affected fleet exposure (Flight Hours)

**Figure 5 - Visualisation Chart for CS-25 (Flight hours)**

For Hazardous Failure Condition



## Figure 6 - Visualisation Chart for CS-25 (Flight Hours)



**AMC 21.3B (b) Unsafe condition**

An unsafe condition exists if there is factual evidence (from service experience, analysis or tests) that:

(a) An event may occur that would result in fatalities, usually with the loss of the aircraft, or reduce the capability of the aircraft or the ability of the crew to cope with adverse operating conditions to the extent that there would be:

(i) A large reduction in safety margins or functional capabilities, or
(ii) Physical distress or excessive workload such that the flight crew cannot be relied upon to perform their tasks accurately or completely, or
(iii) Serious or fatal injury to one or more occupants

unless it is shown that the probability of such an event is within the limit defined by the applicable airworthiness requirements, or

(b) There is an unacceptable risk of serious or fatal injury to persons other than occupants, or

(c) Design features intended to minimise the effects of survivable accidents are not performing their intended function.

Note 1: Non-compliance with applicable airworthiness requirements is generally considered as an unsafe condition, unless it is shown that possible events resulting from this non-compliance do not constitute an unsafe condition as defined under paragraphs (a), (b) and (c).

Note 2: An unsafe condition may exist even though applicable airworthiness requirements are complied with.

Note 3: The above definition covers the majority of cases where DGCA considers there is an unsafe condition. There may be other cases where overriding safety considerations may lead DGCA to issue an airworthiness directive.

Note 4: There may be cases where events can be considered as an unsafe condition if they occur too frequently (significantly beyond the applicable safety objectives) and could eventually lead to consequences listed in paragraph (a) in specific operating environments. Although having less severe immediate consequences than those listed in paragraph (a), the referenced events may reduce the capability of the aircraft or the ability of the crew to cope with adverse operating conditions to the extent that there would be, for example, a significant reduction in safety margins or functional capabilities, a significant increase in crew workload, or in conditions impairing crew efficiency, or discomfort to occupants, possibly including injuries.

**GM 21.3B (b) Determination of an unsafe condition**

It is important to note that these guidelines are not exhaustive. However, this material is intended to provide guidelines and examples that will cover most cases, taking into account the applicable certification requirements.

**1. INTRODUCTION**

Certification or approval of a product, part or appliance is a demonstration of compliance with requirements which are intended to ensure an acceptable level of safety. This demonstration however includes certain accepted assumptions and predicted behaviours, such as:

- fatigue behaviour is based on analysis supported by test,
- modelling techniques are used for "Aircraft Flight Manual" performances calculations,
- the systems safety analyses give predictions of what the systems failure modes, effects and probabilities may be,
- the system components reliability figures are predicted values derived from general experience, tests or analysis,
- the crew is expected to have the skill to apply the procedures correctly, and
- the aircraft is assumed to be maintained in accordance with the prescribed instructions for continued airworthiness (or maintenance programme), etc.

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 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.

See AMC 21.3B (b) for definition of "unsafe condition" used in 21.3A (b).

**2. GUIDELINES FOR ESTABLISHING IF A CONDITION IS UNSAFE**

The following paragraphs give general guidelines for analysing the reported events and determining if an unsafe condition exists, and are provided for each type of product, part or appliance subject to a specific airworthiness approval: type-certificates (TC) or supplemental type-certificates (STC) for aircraft, engines or propellers, or Indian Technical Standard Orders (ITSO).

This analysis may be qualitative or quantitative, i.e. formal and quantitative safety analyses may not be available for older or small aircraft. In such cases, the level of

analysis should be consistent with that required by the airworthiness requirements and may be based on engineering judgement supported by service experience data.

### 2.1 Analysis method for aircraft

#### 2.1.1 Accidents or incidents without any aircraft, engines, system, propeller or part or appliance malfunction or failure

When an accident/incident does not involve any component malfunction or failure but when a crew human factor has been a contributing factor, this should be assessed from a man-machine interface standpoint to determine whether the design is adequate or not. Paragraph 2.5 gives further details on this aspect.

#### 2.1.2 Events involving an aircraft, engines, system, propeller or part or appliance failure, malfunction or defect

The general approach for analysis of in-service events caused by malfunctions, failures or defects will be to analyse the actual failure effects, taking into account previously unforeseen failure modes or improper or unforeseen operating conditions revealed by service experience.

These events may have occurred in service, or have been identified during maintenance, or been identified as a result of subsequent tests, analyses, or quality control.

These may result from a design deficiency or a production deficiency (non conformity with the type design), or from improper maintenance. In this case, it should be determined if improper maintenance is limited to one aircraft, in which case an airworthiness directive may not be issued, or if it is likely to be a general problem due to improper design and/or maintenance procedures, as detailed in paragraph 2.5.

##### 2.1.2.1 Flight

An unsafe condition exists if:

- There is a significant shortfall of the actual performance compared to the approved performance (taking into account the accuracy of the performance calculation method), or

- The handling qualities, although having been found to comply with the applicable airworthiness requirements at the time of initial approval, are subsequently shown by service experience not to comply.

##### 2.1.2.2 Structural or mechanical systems

An unsafe condition exists if the deficiency may lead to a structural or mechanical failure which:

- Could exist in a Principal Structural Element that has not been qualified as damage tolerant. Principal Structural Elements are those which contribute

significantly to carrying flight, ground, and pressurisation loads, and whose failure could result in a catastrophic failure of the aircraft.

Typical examples of such elements are listed for large aeroplanes in advisory material related to CS/FAR 25.571(a) "damage tolerance and fatigue evaluation of structure", and in the equivalent material for rotorcraft.

- Could exist in a Principal Structural Element that has been qualified as damage tolerant, but for which the established inspections, or other procedures, have been shown to be, or may be, inadequate to prevent catastrophic failure.

- Could reduce the structural stiffness to such an extent that the required flutter, divergence or control reversal margins are no longer achieved.

- Could result in the loss of a structural piece that could damage vital parts of the aircraft, cause serious or fatal injuries to persons other than occupants.

- Could, under ultimate load conditions, result in the liberation of items of mass that may injure occupants of the aircraft.

- Could jeopardise proper operation of systems and may lead to hazardous or catastrophic consequences, if this effect has not been taken adequately into account in the initial certification safety assessment.

#### 2.1.2.3 Systems

The consequences of reported systems components malfunctions, failures or defects should be analysed.

For this analysis, the certification data may be used as supporting material, in particular systems safety analyses.

The general approach for analysis of in-service events caused by systems malfunctions, failures or defects will be to analyse the actual failure effects.

As a result of this analysis, an unsafe condition will be assumed if it cannot be shown that the safety objectives for hazardous and catastrophic failure conditions are still achieved, taking into account the actual failure modes and rates of the components affected by the reported deficiency.

The failure probability of a system component may be affected by:

- A design deficiency (the design does not meet the specified reliability or performance).
- A production deficiency (non conformity with the certified type design) that affects either all components, or a certain batch of components.
- Improper installation (for instance, insufficient clearance of pipes to surrounding structure).
- Susceptibility to adverse environment (corrosion, moisture, temperature, vibrations etc.).

- Ageing effects (failure rate increase when the component ages).
- Improper maintenance.

When the failure of a component is not immediately detectable (hidden or latent failures), it is often difficult to have a reasonably accurate estimation of the component failure rate since the only data available are usually results of maintenance or flight crew checks. This failure probability should therefore be conservatively assessed.

As it is difficult to justify that safety objectives for the following systems are still met, a deficiency affecting these types of systems may often lead to a mandatory corrective action:

- back up emergency systems, or
- fire detection and protection systems (including shut off means).

Deficiencies affecting systems used during an emergency evacuation (emergency exits, evacuation assist means, emergency lighting system) and to locate the site of a crash (Emergency Locator Transmitter) will also often lead to mandatory corrective action.

#### 2.1.2.4 Others

In addition to the above, the following conditions are considered unsafe:

- There is a deficiency in certain components which are involved in fire protection or which are intended to minimise/retard the effects of fire/smoke in a survivable crash, preventing them to perform their intended function (for instance, deficiency in cargo liners or cabin material leading to non-compliance with the applicable flammability requirements).

- There is a deficiency in the lightning or High Intensity Radiated Fields protection of a system which may lead to hazardous or catastrophic failure conditions.

- There is a deficiency which could lead to a total loss of power or thrust due to common mode failure.

If there is a deficiency in systems used to assist in the enquiry following an accident or serious incident (e.g., Cockpit Voice Recorder, Flight Data Recorder), preventing them to perform their intended function, DGCA may take mandatory action.

### 2.2 Engines

The consequences and probabilities of engine failures have to be assessed at the aircraft level in accordance with paragraph 2.1, and also at the engine level for those failures considered as Hazardous in applicable airworthiness requirements related to engine.

The latter will be assumed to constitute unsafe conditions, unless it can be shown that the consequences at the aircraft level do not constitute an unsafe condition for a particular aircraft installation.

## 2.3 Propellers

The consequences and probabilities of propeller failures have to be assessed at the aircraft level in accordance with paragraph 2.1, and also at the propeller level for those failures considered as hazardous in applicable airworthiness requirements related to propellers.

The latter will be assumed to constitute unsafe conditions, unless it can be shown that the consequences at the aircraft level do not constitute an unsafe condition for a particular aircraft installation.

## 2.4 Parts and appliances

The consequences and probabilities of equipment failures have to be assessed at the aircraft level in accordance with paragraph 2.1.

## 2.5 Human factors aspects in establishing and correcting unsafe conditions

This paragraph provides guidance on the way to treat an unsafe condition resulting from a maintenance or crew error observed in service.

It is recognised that human factors techniques are under development. However, the following is a preliminary guidance on the subject.

Systematic review should be used to assess whether the crew or maintenance error raises issues that require regulatory action (whether in design or other areas), or should be noted as an isolated event without intervention. This may need the establishment of a multidisciplinary team (designers, crews, human factors experts, maintenance experts, operators etc.)

The assessment should include at least the following:

- Characteristics of the design intended to prevent or discourage incorrect assembly or operation;
- Characteristics of the design that allow or facilitate incorrect operation,
- Unique characteristics of a design feature differing from established design practices;
- The presence of indications or feedback that alerts the operator to an erroneous condition;
- The existence of similar previous events, and whether or not they resulted (on those occasions) in unsafe conditions;
- Complexity of the system, associated procedures and training (Has the crew a good understanding of the system and its logic after a standard crew qualification programme?);
- Clarity/accuracy/availability/currency and practical applicability of manuals and procedures;
- Any issues arising from interactions between personnel, such as shift changeover, dual inspections, team operations, supervision (or lack of it), or fatigue.

Apart from a design change, the corrective actions, if found necessary, may consist of modifications of the manuals, inspections, training programmes, and/or information to the operators about particular design features. DGCA may decide to make mandatory such corrective actions, if necessary.

**AMC 21.4Transferring of information on eligibility and approval status from the design holder to production organisations**

Where there is a need to provide (normally outside the design organisation) a visible statement of approved design data or airworthiness or environmental protection data associated with the approved design data, the following minimum information must be provided. The need for a visible statement may be in relation to a company holding a production organisation approval (POA) in relation to 21.163(c).

The procedures related to the use of forms or other electronic means to provide this information must be agreed with DGCA.

**Information to be provided:**

**Company Name:** the name of the responsible design organisation (TC, STC, approval of repair or minor change design, ITSO authorisation holder) issuing the information.

**Date**: the date at which the information is released.

**Eligibility**: indicate the specific products or articles, in case of ITSO authorisation, for which data have been approved.

**Identification**: the part number of the part or appliance. Preference should be given to the use of the Illustrated Parts Catalogue (IPC) designation. Alternatively, the reference to the instruction for continued airworthiness (e.g., SB, AMM, etc.) could be stated. Marking requirements of CAR 21, Subpart Q should be taken into account.

**Description**: the name or description of the part or document should be given. In the case of a part or appliance preference should be given to use of IPC designation. The description is to include reference to any applicable ITSO authorization or previous national approvals still valid.

**Purpose of data:** the reason for the provision of the information should be stated by the design organisation approval (DOA) holder.

Examples:

a) Provision of approved design data to a production organisation to permit manufacture (AMC No 1 to 21.133(b) and (c))

b) Information regarding eligibility for installation (replacement parts, repair, modification, etc.)

c) Direct Delivery Authorisation (AMC No 1 to 21.133(b) and (c))

If the data is in support of a change or repair, then reference to the aircraft level approval should be given (make reference to the approved STC, change or repair).

**Limitations/Remarks:** state any information, either directly or by reference to supporting documentation that identifies any particular data or limitations (including specific importing requirements) needed by a production organisation to complete Block 13 of Form CA-1.

**Approval:** provide reference information related to the approval of the data (DGCA document or DOA privilege).

**Authorised signature:** name and hand-written normal or electronic signature of a person who has written authority from the design organisation, as indicated in the procedures agreed with DGCA.

# Subpart B – Type-certificates and Restricted Type-Certificates

**GM 21.14(b) Eligibility for alternative procedures**

Design organisations approved under CAR 21 Subpart JA should be the normal approach for type certification, supplemental type certification, approval of major changes to type design or approval of major repair design, except when agreed otherwise by DGCA in accordance with 21.14, 21.112B and 21.432B.

The acceptance of alternative procedures, as defined in AMC 21.14(b), should be limited where DGCA finds it more appropriate for the conduct of type certification, supplemental type certification, approval of changes to type design, approval of repair design.

**AMC 21.14(b) Alternative Procedures**

Alternative procedures are an acceptable means to demonstrate design capability in the cases described in 21.14, 21.112Bor 21.432B. This concept is the implementation, in the context of specific projects, of procedures required in Subpart JA-DOA, to ensure that the applicant will perform relevant activities as expected by DGCA, but without the requirements on the organisation itself that can be found in Subpart JA. The establishment of these alternative procedures may be seen as a starting phase for a Subpart JA-DOA, allowing at a later stage, at the discretion of the applicant, to move towards a full Subpart JA-DOA by the addition of the missing elements.

**1 Scope**

1.1 As alternative to DOA, a manual of procedures must set out specific design practices, resources and sequence of activities relevant for the specific projects, taking account of CAR 21 requirements.

1.2 These procedures must be concise and limited to the information needed for quality and proper control of activities by the applicant/holder, and by DGCA.

**2 Management of the (supplemental) type certification process**

2.1 Certification programme: See AMC 21.20(b) for type-certification and AMC 21.114 for supplemental type-certification

2.2 Compliance documentation: see AMC 21.20(c)

**3 Management of design changes**

**3.1 Approval of changes to type design, repairs and production deviations from the approved design data**

The TC or STC applicant must provide procedures acceptable to DGCA for classification and approval of changes to type design (see paragraphs 3.2 and 3.3), and repairs and production deviations from the approved design data (see paragraph 3.4).

### 3.2 Classification

#### 3.2.1 Content

The procedure must address the following points:

- identification of changes to type design
- airworthiness classification
- changes to type design initiated by subcontractors
- documents to justify the classification
- authorised signatories

Criteria used for classification must be in compliance with 21.91 and corresponding interpretations.

#### 3.2.2 Identification of changes to type design

The procedure must indicate how the following are identified:

- major changes to type design
- those minor changes to type design where additional work is necessary to demonstrate compliance with the airworthiness requirements
- other minor changes to type design requiring no further demonstrating of compliance.

#### 3.2.3 Airworthiness classification

The procedure must show how the effects on airworthiness are analysed, from the very beginning, by reference to the applicable requirements.

If no specific requirements are applicable to the change, the above review must be carried out at the level of the part or system where the change is integrated and where specific requirements are applicable.

#### 3.2.4 Control of changes to type design initiated by subcontractors

The procedure must indicate, directly or by cross-reference to written procedures, how changes to type design initiated by subcontractors are controlled.

#### 3.2.5 Documents to justify the classification

All decisions of classification of changes to type design must be documented and approved by DGCA. It may be in the format of meeting notes or register.

#### 3.2.6 Authorised Signatories

The procedure should identify the persons authorised to sign the proposed classification before release to DGCA for approval.

### 3.3 Approval of changes to type design

#### 3.3.1 Content

The procedure must address the following points:

- compliance documentation
- approval process
- authorised signatories

#### 3.3.2 Compliance documentation

For major changes and those minor changes to type design where additional work to demonstrate compliance with the applicable airworthiness requirements is necessary, compliance documentation must be established in accordance with AMC 21.20(c).

#### 3.3.3 Approval process

A For the approval of major changes to type design, a certification programme as defined in AMC 21.97 must be established.

B For major changes and those minor changes to type design where additional work to show compliance with the applicable airworthiness requirements is necessary, the procedure should define a document to support the approval process.

This document must include at least:

- identification and brief description of the change and its classification
- applicable requirements
- reference to the compliance documents
- effects, if any, on limitations and on the approved documentation
- authorised signatory

C For the other minor changes, the procedure must define a means:

- to identify the change
- to present the change to DGCA for approval.

#### 3.3.4 Authorised Signatories

The procedure must identify the persons authorised to sign the change before release to DGCA for approval.

### 3.4 Repairs and production deviations from the approved design data

A procedure following the principles of paragraphs 3.2 and 3.3 must be established for the classification and approval of repairs and unintentional deviations from the approved design data occurring in production (concessions or non-conformance's). For repairs, the procedure must be established in accordance with CAR 21 Subpart M and associated acceptable means of compliance (AMC) or guidance material (GM).

## 4 Issue of information and instructions to owners, operators or others required to use the data

### 4.1 General

The information or instructions issued by a TC, STC, approval of changes to type design, approval of repair design holder are intended to provide the owners of a product with all necessary data to implement a change on the product, or a repair, or to inspect it.

The information or instructions may be issued in a format of a Service Bulletin as defined in ATA 100 system, or in Structural Repair Manuals, Maintenance Manuals, Engine and Propeller Manuals, etc.

The preparation of this data involves design, production and inspection. The three aspects should be properly addressed and a procedure should exist.

### 4.2 Procedure

The procedure should address the following points:

- preparation
- verification of technical consistency with corresponding approved change(s), repair(s) or approved data, including affectivity, description, effects on airworthiness, especially when limitations are changed
- verification of the feasibility in practical applications.

The persons authorised to sign before release of information and instructions to DGCA for approval should be identified in the procedure.

The procedure should include the information or instructions prepared by subcontractors or vendors, and declared applicable to its products by the TC, STC, approval of changes to type design or approval of repair design holders.

### 4.3 Statement

The information and instructions should contain a statement showing DGCA approval.

## 5 Obligations addressed in 21.44 (TC holder), 21.118A (STC holder) or 21.451 (repair design approval holder)

The applicant should establish the necessary procedures to show to DGCA how it will fulfil the obligations required under 21.44, 21.118A or 21.451, as appropriate.

**6 Control of design subcontractors**

The applicant should establish the necessary procedures to show to DGCA how it will control design subcontractors.

**GM 21.16A(a)(1)**

The applicable Airworthiness Criteria /requirements for the purpose of demonstration of compliance to Vertical takeoff capable aircraft (VCA) for type certification are specified in AEAC NO. 01 of 2024 and its subsequent amendments issued from time to time.

**GM 21.16BSpecial Conditions**

**21.16B** introduces 3 categories of Special Conditions:

1 Novel and unusual design features;
2 Unconventional use of product;
3 Service experience has shown that unsafe conditions may exist.

However, the need for a Special Condition based on in-service experience should be judged by using the following points as benchmarks:

- The words "unsafe conditions" are used in GM 21.3B (b) to justify the basis for an airworthiness directive.
- The words "continued safe flight and landing", according to advisory material related to CS/FAR 25.1309, mean the capability for continued controlled flight and landing, possibly using emergency procedures, but without requiring exceptional pilot skill or strength. Some aircraft damage may be associated with a failure condition, during flight or upon landing.

**AMC 21.20(b) Certification programme**

1. For a particular project and as part of the technical familiarisation, the applicant provides a certification programme that includes:

1.1 a plan containing the following information:

- Description of the project and the kind of operations envisaged
- The proposed airworthiness codes, special conditions, equivalent safety findings and environmental protection requirements
- The description on how compliance will be demonstrated, with proposed means of compliance (see appendix to this AMC below for codes), and any selected guidance material. The description of the means of compliance should be

- sufficient to determine that all necessary data will be collected and compliance can be demonstrated.
- A compliance checklist addressing each paragraphs of the type-certification basis and environmental protection requirements applicable to the project, with reference to the means of compliance and to the related compliance documents.
- Identification of relevant personnel making decisions affecting airworthiness and environmental protection interfacing with the DGCA, unless otherwise identified to the DGCA;

1.2 a project schedule including major milestones.

2. The certification programme can be developed step by step, when the information needed is not available at the beginning of the project.

3. For a simple project, the certification programme can be proposed with the application.

4. The certification programme can be based on modules that can be updated independently.

**Appendix to AMC 21.20(b) - Means of compliance codes**

| **Type of Compliance** | **Means of Compliance** | **Associated Compliance Documents** |
|---|---|---|
| Engineering evaluation | MC0 :<br>- Compliance statement<br>- Reference to Type Design documents<br>- Election of methods, factors<br>- Definitions | - Type Design documents<br>- Recorded statements |
| | MC1: Design review | - Descriptions<br>- Drawings |
| | MC2: Calculation/ Analysis | - Substantiation reports |
| | MC3: Safety assessment | - Safety analysis |
| Tests | MC4: Laboratory tests | - Test programmes<br>- Test reports<br>- Test interpretations |
| | MC5: Ground tests on related product | |
| | MC6: Flight tests | |
| | MC8: Simulation | |

| | | |
|---|---|---|
| Inspection | MC7: Design inspection/ audit | - Inspection or audit reports |
| Equipment qualification | MC9: Equipment qualification | Note: Equipment qualification is a process which may include all previous means of compliance. |

**GM 21.20(b) Update to the Certification Programme**

The applicant should keep the certification programme current throughout the project and submit all revised elements to the DGCA.

**AMC 21.20(c) Compliance documentation**

1. Compliance documentation comprises of one or more reports, drawings, specifications, calculations, analysis etc. and provides a record of the means by which compliance with the applicable type-certification basis and environmental protection requirements is demonstrated.
2. Each compliance document should normally contain:
   - an adequate link with the corresponding certification programme
   - the reference of the airworthiness codes, special conditions or environmental protection requirements addressed by the document
   - data demonstrating compliance
   - a statement by the applicant declaring that the document provides the proof of compliance for which it has been created
   - the appropriate authorised signature.
3. Each compliance document should have a number and issue date. The various issues of a document should be controlled.

**GM 21.20(d) Final statement**

All compliance demonstrations should be completed before issuance of the final statement of compliance required by 21.20(d).

If so agreed by the DGCA, some compliance documentation may be produced after issuance of the final statement of compliance required by 21.20(d).

**GM 21.20 (f) Acceptance of certification documents/reports approved by military certification authority**

i. Military certification basis and compliance demonstration will be acceptable to DGCA if the military certification design code is found equivalent to/more stringent than the applicable civil certification design code for the product designed/manufactured within India and certified by military certification authorities.

ii. If, the applicable military prototype structures and system are found equivalent w.r.t. civil variant SOP in order to ascertain the data generated for military prototype, can be made applicable to civil variant also. If required, the existing analysis report should be updated for compliance demonstration to civil requirements that was not a part of military compliance standards.

iii. For this purpose the applicant must provide

(a) a comparative analysis of civil standard vs. military standard,
(b) compliance plan to comply the civil standards where military applicable standards are less stringent or does not have equivalent provision vis-a-vis civil standards on mutually agreed means of compliance,
(c) copy of test specification for test article accepted by military certification authority for compliance demonstration and amendments thereon
(d) other information that may come out during the deliberation process

In case applicant choose to demonstrate compliance directly to the applicable civil requirements of already military certified aircraft/modifications, then the laid down civil certification procedures shall be applicable.

**GM 21.33 Investigation and Tests**

The requirements of 21.33(a) should not preclude the applicant requesting DGCA to make flight or other tests of particular aspects of the product during its development and before the type design is fully defined and a Declaration of Compliance can be issued for all the applicable CS/FAR. However, in case of flight test the applicant should have performed subject tests and should ensure that no features of the product preclude the safe conduct of the evaluation requested. DGCA may require to repeat any such tests once the type design is fully defined to ensure that subsequent changes have not adversely affected the conclusions from any earlier evaluation. A statement of compliance with sub-paragraph 21.33(b) is also required for the above tests.GM 21.35Flight Tests

Detailed material on flight testing is included in the applicable advisory material related to CS/FAR.

**GM 21.35(b) (2) Objective and Content of Function and Reliability Testing**

**1 OBJECTIVE**

The objective of this testing is to expose the aircraft to the variety of uses, including training, that are likely to occur when in routine service to provide an assurance that it performs its intended functions to the standard required for certification and should continue to do so in service.

**2 CONTENT OF FUNCTION AND RELIABILITY TESTING**

The testing should cover both routine operations and some simulation of abnormal conditions. The details of the programme should be agreed with DGCA prior to

commencement of testing.

It may be possible to combine this testing with any other requirements to show compliance with the applicable CS/FAR. This will be agreed on a case-to-case basis with DGCA.

Where possible, testing conditions should be defined with the co-operation of an operator.

A substantial proportion of the flying should be on a single aircraft. The flying should be carried out to a continuous schedule on an aircraft that is very close to the final type design, operated as though it were in service and should include a range of representative ambient operating conditions and airfields.

**GM 21.35(f) (1)Flying Time for Function and Reliability Testing**

All flying carried out with engines and associated systems not significantly different from the final type-certificate standard may count towards the 300 hours airframe flight time required by 21.35(f)(1). At least 150 of the 300 flying hours should be conducted on a dedicated production configured aircraft. The requirement for 300 hours relevant flight time whenever a new turbine engine is incorporated applies regardless of whether the airframe/engine combination is subject to a new type-certificate or is to be certificated as a change or supplement to an existing type-certificate.

**GM 21.35(f) (2)Flying Time for Function and Reliability Testing**

All flying carried out on an aircraft not significantly different from the final type design may count towards the 150 hours airframe flight time required by 21.35(f)(2).

# Subpart C – Not applicable

# Subpart D – Changes to type-certificates and restricted type-certificates

**GM 21.91Classification of changes to a type design**

**1. PURPOSE OF CLASSIFICATION**

Classification of changes to a type design into MAJOR or MINOR is to determine the approval route to be followed in CAR 21 Subpart D, i.e., either 21.95 or 21.97, or alternatively whether application and approval has to be made in accordance with CAR 21 Subpart E.

**2. INTRODUCTION**

**2.1** 21.91 proposes criteria for the classification of changes to a type design as minor and major.

(i) This GM is intended to provide guidance on the term appreciable effect affecting the airworthiness of the product from 21.91, where "airworthiness" is interpreted in the context of a product in conformity with type design and in condition for safe operation.
It provides complementary guidelines to assess a design change in order to fulfil the requirements of 21.91and 21.117 where classification is the first step of a procedure.

Note: For classification of Repairs see GM 21.435(a).

(ii) Although this GM provides guidance on the classification of major changes, as opposed to minor changes as defined in 21.91, the GM and 21.91are deemed entirely compatible.

**2.2** For an ITSO authorisation, 21.611 gives specific additional requirements for design changes to ITSO articles.
For APU, this GM should be used.

**3 ASSESSMENT OF A DESIGN CHANGE FOR CLASSIFICATION**

**3.1 Changes to the type design**

21.31 defines what constitutes the type design. Alteration to any of the data included within the scope of 21.31is considered a change to the type design.

**3.2 Classification Process (see attached diagram)**

21.91requires all changes to be classified as either major or minor, using the criteria of 21.91and the complementary guidance of paragraph 3.3.

On some occasions, the classification process is initiated at a time when some data necessary to make a classification decision are not yet available.

Therefore, the applicant should wait for availability of data before proposing a classification.
A simple design change planned to be mandated by an airworthiness directive may be reclassified minor due to the involvement of DGCA in the continued airworthiness process.

Reasons for a proposed classification should be submitted.

### 3.3 Complementary guidance for classification of changes

A change to the type design is judged to have an "appreciable effect on other characteristics affecting the airworthiness of the product" and therefore should be classified as major, in particular but not only, when one or more of the following conditions are met:

(i) Where the change requires an adjustment of the type-certification basis (such as special condition, equivalent safety finding, elect to comply, earlier airworthiness codes (reversion), later airworthiness codes).

(ii) Where the applicant proposes a new interpretation of the requirements used for the type-certification basis of the type of product that has not been published as AMC material or otherwise agreed with DGCA.

(iii) Where the demonstration of compliance uses methods that have not been previously accepted as appropriate for the nature of the change to the product or for similar changes to other products designed by the applicant.

(iv) Where the extent of new substantiation data necessary to comply with the applicable airworthiness requirements and the degree to which the original substantiation data has to be re-assessed and re-evaluated is considerable.

(v) The change alters the Airworthiness Limitations or the Operating Limitations.

(vi) The change is made mandatory by an airworthiness directive or the change is the terminating action of an airworthiness directive (ref. 21.3B). See note 1.

(vii) Where the change introduces or affects functions where the failure effect is classified as catastrophic or hazardous.

**Note 1:** The design change previously classified as minor and approved prior to the airworthiness directive issuance decision needs no re-classification. However, DGCA retains the right to review the change and re-classify/re-approve if found necessary.

**Note 2:** These above conditions are an explanation of the criteria noted in 21.91.

For an understanding of how to apply the above conditions, it is useful to take note of the examples given in Appendix A to GM 21.91.

**Appendix A to GM 21.91: Examples of Major Changes per discipline**

The information below is intended to provide a few major change examples per discipline, resulting from application of 21.91and paragraph 3.3 conditions. It is not intended to present a comprehensive list of all major changes. Examples are categorised per discipline and are applicable to all products (aircraft, engines and propellers). However, a particular change may involve more than one discipline, e.g., a change to engine controls may be covered in engines and systems (software).

Those involved with classification should always be aware of the interaction between disciplines and the consequences this will have when assessing the effects of a change (i.e., operations and structures, systems and structures, systems and systems, etc.; see example in paragraph 2 (ii).

Specific rules may exist which override the guidance of these examples.

In the CAR 21 a negative definition is given of minor changes only. However in the following list of examples it was preferred to give examples of major changes.

Where in this list of examples the words "has effect" or "affect(s)" are used, they have always to be understood as being the opposite of "no appreciable effect" as in the definition of minor change in 21.91. Strictly speaking the words "has appreciable effect" and "appreciably affect(s)" should have been used, but this has not been done to improve readability.

**1 Structure**

(i) changes such as a cargo door cut-out, fuselage plugs, change of dihedral, addition of floats;
(ii) changes to materials, processes or methods of manufacture of primary structural elements, such as spars, frames and critical parts;
(iii) changes that adversely affect fatigue or damage tolerance or life limit characteristics;
(iv) changes that adversely affect aero elastic characteristics.

**2 Cabin Safety**

(i) changes which introduce a new cabin layout of sufficient change to require a reassessment of emergency evacuation capability or which adversely affect other aspects of passenger or crew safety.

Items to consider include, but are not limited to,
- changes to or introduction of dynamically tested seats.
- change to the pitch between seat rows.
- change of distance between seat and adjacent obstacle like a divider.
- changes to cabin lay outs that affect evacuation path or access to exits.
- installation of new galleys, toilets, wardrobes, etc.
- installation of new type of electrically powered galley insert.

(ii) changes to the pressurisation control system which adversely affect previously approved limitations.

**3 Flight**

Changes which adversely affect the approved performance, such as high altitude operation, brake changes that affect braking performance.

Changes which adversely affect the flight envelope.

Changes which adversely affect the handling qualities of the product including changes to the flight controls function (gains adjustments, functional modification to software) or changes to the flight protection or warning system.

**4 Systems**

For systems assessed under CS/ FAR 25.1309, the classification process is based on the functional aspects of the change and its potential effects on safety.

(i) Where failure effect is 'Catastrophic' or 'Hazardous', the change should be classified as major.

(ii) Where failure effect is 'major', the change should be classified as major if:
- aspects of the compliance demonstration use means that have not been previously accepted for the nature of the change to the system; or
- the change affects the pilot/system interface (displays, controls, approved procedures); or
- the change introduces new types of functions/systems such as GPS primary, TCAS, Predictive wind shear, HUD.

The assessment of the criteria for software changes to systems also needs to be performed. When software is involved, account should be taken also of the following guidelines:

Where a change is made to software produced in accordance with the guidelines of the latest edition of EUROCAE ED12/RTCA DO-178 "Software Considerations in Airborne Systems and Equipment Certification", the change should be classified as major if either of the following apply, and the failure effect is Catastrophic, Hazardous or Major:

(1) the executable code for software, determined to be Level A or Level B in accordance with the guidelines, is changed unless that change involves only a variation of a parameter value within a range already verified for the previous certification standard; or

(2) the software is upgraded to or downgraded from Level A, Level B or Level C; or

(3) the executable code, determined to be level C, is deeply changed, e.g., after a software reengineering process accompanying a change of processor.

For software developed to guidelines other than the latest edition of ED-12/DO-178, the applicant should assess changes in accordance with the foregoing principles.

For other codes the principles noted above may be used. However, due consideration should be given to specific requirements/interpretations.

**5 Propellers**

Changes to:

(i) diameter
(ii) airfoil
(iii) planform
(iv) material
(v) blade retention system, etc.

**6. Engines**

Changes:

(i) that adversely affect operating speeds, temperatures, and other limitations.
(ii) that affect or introduce parts identified by applicable airworthiness requirements related to engine where the failure effect has been shown to be hazardous.
(iii) that affect or introduce engine critical parts or their life limits.
(iv) to a structural part which requires a re-substantiation of the fatigue and static load determination used during certification.
(v) to any part of the engine which adversely affects the existing containment capability of the structure.
(vi) that adversely affect the fuel, oil and air systems, which alter the method of operation, or require re-investigation against the type-certification basis.
(vii) that introduce new materials or processes, particularly on critical components.

**7 Rotors and drive systems**

Changes that:

(i) adversely affect fatigue evaluation unless the service life or inspection interval are unchanged. This includes changes to materials, processes or methods of manufacture of parts, such as
- rotor blades
- rotor hubs including dampers and controls
- gears
- drive shafts
- couplings

(ii) affect systems the failure of which may have hazardous or catastrophic effects. The design assessment will include:
- cooling system
- lubrication system
- rotor controls

(iii) adversely affect the results of the rotor drive system endurance test, the rotor drive system being defined in CS 27/29-917 or FAR 27/29-917.

(iv) adversely affect the results of the shafting critical speed analysis required by CS 27/29-931or FAR 27/29-931.

## 8 Environment

The introductory text to Appendix A to GM 21.91 describes how in CAR 21 a negative definition is given of minor changes only. This philosophy is similar to the manner in which the ICAO Standards and Recommended Practices for environmental protection (ICAO Annex 16) and the associated Guidance Material (ICAO Environmental Technical Manual) define changes affecting a product's environmental characteristics in terms of 'no-acoustical changes' and 'no-emissions changes' (i.e. changes which do not appreciably affect the product's environmental characteristics).

Following the general philosophy of this Appendix, however, it is preferred to give examples of changes which might have an appreciable effect on a product's environmental characteristics (i.e. the effect might be greater than the no-acoustic change and no-emissions change criteria) and might therefore lead to a major change classification.

Where a change is made to an aircraft or aircraft engine, the effect of the change on the product's environmental characteristics should be taken into account. Examples of changes that might have an appreciable effect on the product's environmental characteristics, and might therefore be classified as a major change, are listed below. The examples are not exhaustive and will not, in every case, result in an appreciable change to the product's environmental characteristics, and therefore, will not per-se and in every case result in a major change classification.

An appreciable effect is considered to be one which exceeds the ICAO criteria for a no-acoustical change or a no-emissions change. For the definition of a no-acoustical change refer to the section of the ICAO Environmental Technical Manual, Volume I (ICAO Doc 9501, Volume I – Procedures for the Noise Certification of Aircraft) concerning changes to aircraft type designs involving no-acoustical changes (see also the definitions of a 'derived version' in ICAO Annex 16, Volume I). For the definition of a no-emissions change refer to the section of the ICAO Environmental Technical Manual, Volume II (ICAO Doc 9501, Volume II – Procedures for the Emissions Certification of Aircraft Engines) concerning no-emissions changes.

**(i) Noise:** A change that introduces either:

- an increase in the noise certification level(s); or
- a reduction in the noise certification level(s) for which the applicant wishes to take credit.

Examples of noise-related changes that might lead to a major change classification are:

(1) For jet and heavy (maximum take-off mass greater than 8618 kg) propeller-driven aeroplanes:

- A change that might affect the aircraft's take-off performance including:
  - a change to the maximum take-off mass;
  - a change to V2 ('take-off safety speed'); or
  - a change to the lift augmentation devices, including their configuration under normal take-off operating conditions.
- A change that might affect the aircraft's landing performance including:
  - a change to the maximum landing mass;

- a change to VREF (reference landing speed); or
- a change to the lift augmentation devices, including their deployment under normal landing operating conditions.

- A change to the Centre of Gravity (CG) limits;
- A change that increases the aircraft's drag;
- A change that alters the external profile of the aircraft, including the installation or change of shape or size of any item on the external surface of the aircraft that might protrude into the airflow such as winglets and vortex generators; generally the installation of small antennas does not represent an acoustical change;
- A change that introduces an open-ended hollow cavity at more or less right angles to the airflow (e.g. hollow pins in undercarriage assemblies);
- A change of engine or, if fitted, propeller type;
- A change in engine thrust rating;
- A change to the engine rotating parts or stators, such as geometry, blade profile or blade number;
- A change to the aerodynamic flow lines through the engine;
- A change that affects the engine thermodynamic cycle, including a change to the engine's bypass ratio;
- A change to the engine nacelle, including a change to the acoustic liners;
- A change to the engine exhaust;
- A change to the engine bleed valves, including bleed valve scheduling;
- A change in the operation of engine power off-takes (e.g. the operation of the Environmental Control System (ECS) during a normal take-off or approach);
- A change to the Auxiliary Power Unit (APU), including associated operating limitations (e.g. a change that allows the APU to be operated during a normal approach when previously it was not allowed);
- A change to the propeller pitch and/or propeller speed during a normal take-off or approach;
- A change that causes a change to the angle at which air flows into the propeller.

(2) For light (maximum take-off mass 8618 kg or less) propeller-driven aeroplanes:

- A change that might affect the aircraft's take-off performance including:
  - a change to the maximum take-off mass;
  - a change to the take-off distance;
  - a change to the rate of climb; or
  - a change to Vy (best rate of climb speed).
- A change that increases the aircraft's drag (e.g. the installation of external cargo pods, external fuel tanks, larger tyres to a fixed undercarriage, floats etc.);
- A change of engine or propeller type;
- A change in take-off power including a change in engine speed (tachometer 'red line') or, for piston engines, a change to the manifold pressure limitations;

- A change to the highest power in the normal operating range ('top of green arc');
- In the case of an aircraft where take-off power/engine speed is time limited, a change in the period over which take-off power/engine speed may be applied;
- A change to the engine inlet or exhaust including, if fitted, the inlet or exhaust muffler;
- A change in propeller diameter, tip shape, blade thickness or the number of blades;
- The installation of a variable or adjustable pitch propeller in place of a fixed pitch propeller and vice versa;
- A change that causes a change to the angle at which air flows into the propeller.

(3) For helicopters:

- A change that might affect the take-off and/or landing performance, including a change in take-off mass and $V_Y$ (best rate of climb speed);
- A change to $V_{NE}$ (never-exceed airspeed) or to $V_H$ (airspeed in level flight obtained using the torque corresponding to minimum engine installed, maximum continuous power available for sea level pressure, 25°C ambient conditions at the relevant maximum certificated mass);
- A change to the maximum take-off engine power or maximum continuous power;
- A change to the gearbox torque limits;
- A change of engine type;
- A change to the engine intake or exhaust;
- A change to the maximum normal operating rpm of the main or tail rotors;
- A change to the main or tail rotors, including a change in diameter, blade thickness or blade tip profile.

Note: The effect on the helicopter's noise characteristics of either carrying external loads or the installation of external equipment need not be considered.

(ii) **Emissions:** A change that introduces an increase or decrease in the emissions certification levels. Examples of smoke and gaseous engine emission-related changes that might lead to a major change classification are:

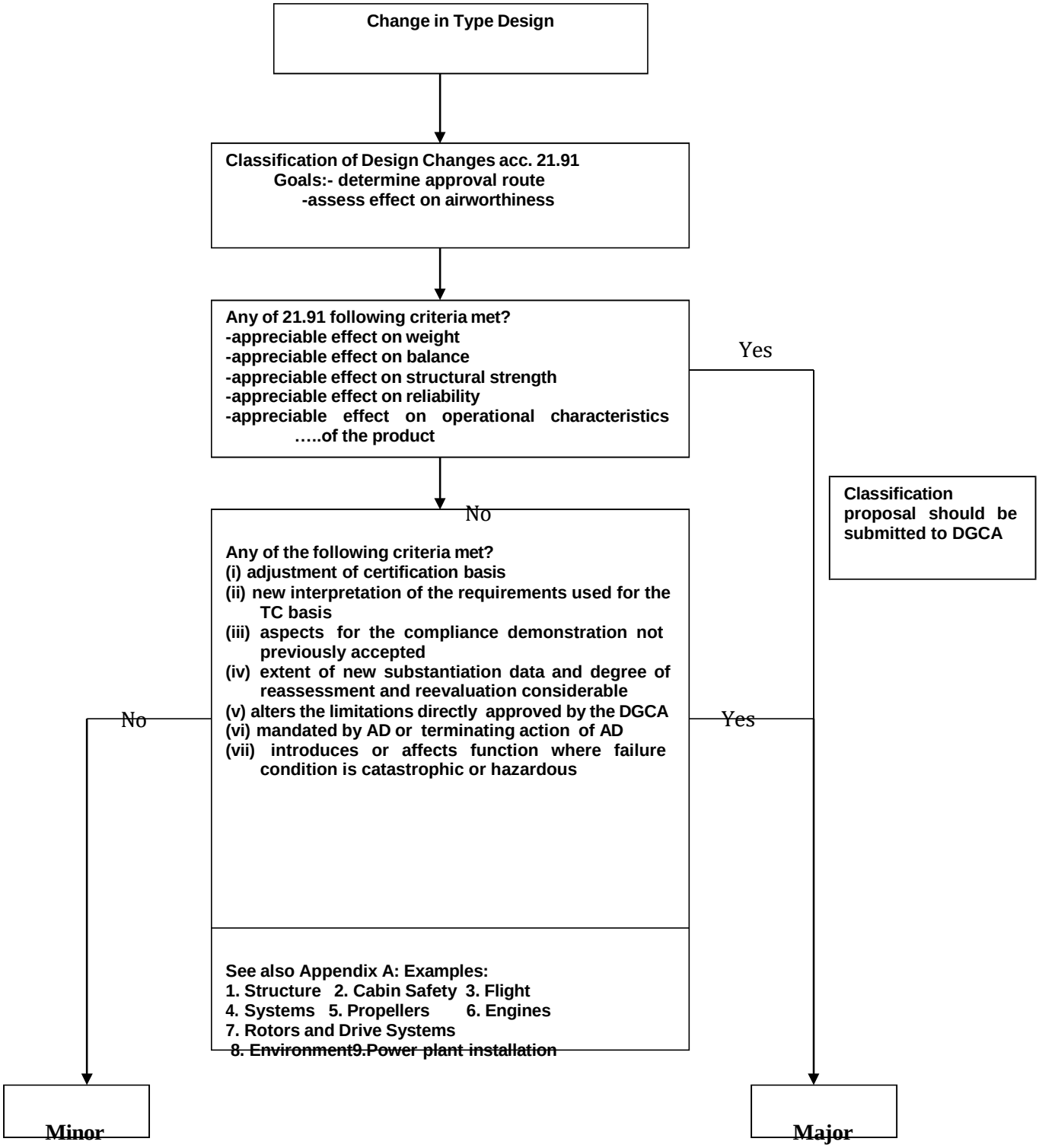
- A change in engine thrust rating;
- A change to the aerodynamic flow lines through the engine;
- A change that affects the engine thermodynamic cycle, specifically relevant engine cycle parameters (e.g. combustor pressure P3, combustor entry temperature T3, Air Fuel Ratio (AFR));
- A change to the compressor that might influence the combustor inlet conditions and engine overall pressure ratio;
- A change to the combustor design (geometry);
- A change to the cooling of the combustor;
- A change to the air mass flow through the combustor;
- A change that affects the fuel spray characteristics.

## 9 Power plant Installation

Changes which include:

(i) control system changes which affect the engine/propeller/airframe interface;
(ii) new instrumentation displaying operating limits;
(iii) modifications to the fuel system and tanks (number, size and configuration);
(iv) change of engine/propeller type.

**Classification process**



**GM 21.93(b) Major Changes: Application**

Identification of re-investigations necessary to show compliance does not mean the showing of compliance itself, but the list of affected type design requirement paragraphs for which a new demonstration is necessary, together with the means (calculation, test or analysis) by which it is proposed to show compliance.

**AMC 21.97 Compliance demonstration process for major changes**

1. AMC/GM to 21.20 should be used for a major change.
2. For major changes not requiring long and complex compliance demonstration activities, a certification programme, as described in AMC 21.20(b), can be submitted with the application in a simplified format. The certification programme should contain at least the following elements:

    - Purpose of change
    - Description of change
    - Applicability
    - Applicable airworthiness codes, special conditions, equivalent safety findings and environmental protection requirements
    - The description on how compliance will be demonstrated, with selected means of compliance (see Appendix to AMC 21.20(b) for the codes to be used) and reference to compliance documents
    - If relevant, the delivery schedule of compliance documents.

**GM 21.101 Establishment of the Type-Certification Basis of changed aeronautical products**

**Foreword**

This guidance material (GM) provides guidance for the application of the Changed Product Rule (CPR) 21.101 and 21.19, for changes made to type-certificated aeronautical products.

**Chapter 1. Introduction**

1. Purpose

a. The DGCA wrote this GM to provide guidance for establishing the type-certification basis for changed aeronautical products in accordance with 21.101and to help identify if it will be necessary to apply for a new type-certificate (TC) under 21.19. The guidance describes the process for establishing the type-certification basis for changes to type certificates or restricted type-certificates, supplemental type certificates (STC) and amended STCs, detailing evaluations, classifications, and decisions made throughout the process.

b. The content of this GM is divided into 4 Chapters and 5 Appendices:

(1) Chapter 1 explains the purpose of this GM, describes its content, specifies the intended audience, and clarifies which changes are within the scope of applicability of this GM. Chapter 1 also contains definitions and terminology used in this GM for application of 21.101 and 21.19.

(2) Chapter 2 provides a general overview of 21.101 and 21.19, clarifies the principles and safety objectives and directs applicants to the applicable guidance contained in subsequent chapters of this GM.

(3) Chapter 3 contains guidance for implementation of 21.101(a) and (b) to establish the type-certification basis for changed aeronautical products. Chapter 3 describes in detail the various steps of the 'top-down' certification basis development approach. Chapter 3 also addresses 21.19considerations to identify conditions under which an applicant for a type design change is required to submit application for a new TC and provides guidance at which stage of the process this assessment is to be performed.

(4) Chapter 4 contains considerations for design related operating requirements, guidance for establishing type-certification basis for changes on certain small aeroplanes and rotorcraft under specified maximum weight ('excepted products'), guidance for use of special conditions under 21.101(d), guidance on the effective period of an application, guidance for establishing the type-certification basis for changes on aircraft designed or modified for a special purpose (to operate under a special certificate of airworthiness) and guidance for documentation of revisions to the type-certification basis.

(5) Appendix A contains examples of typical type design changes for small aeroplanes, large aeroplanes, rotorcraft, engines, and propellers which are categorised by the DGCA into individual tables according to the classifications to the level of design change - substantial, significant, and not significant.

(6) Appendix B provides detailed guidance with examples for evaluating when compliance would be impractical under the 'impracticality' exception in the rule.

(7) Appendix C provides guidance with examples on use of relevant service experience in the certification process as one way to show that the latest airworthiness codes may not contribute materially to the level of safety, allowing the use of earlier airworthiness codes.

(8) Appendix D contains figures and tables considered useful for understanding of the basic terms used and their mutual relations to assist correct application of this GM.

(9) Appendix E contains cross-references to relevant requirements of CAR 21 related to application of 21.19and 21.101.

c. This GM describes an acceptable means, but not the only means to comply with 21.101and 21.19. However, if an applicant chooses to use the means described in this GM, they must follow it entirely.

2. Audience

This GM is for applicants applying for:

- major changes to type design of products under 21.97 and to type design of Auxiliary Power Units (APUs) under 21.604(b)),
- supplemental type-certificates (STCs) under 21.113, or
- major changes to STCs under 21.117 (b).

3. Applicability

a. *Reserved*.

b. This GM applies to major type design changes under 21.101for aeronautical products type-certificated, restricted type-certificated, supplemental type-certificated or ITSO approved (APU) under CAR 21 (ref. 21.21. 21.23, 21.115, 21.604), with application for the type-certification basis of the airworthiness code of the applicable CS (CS-VLA, CS-22, CS-23, CS-25 etc.).

c. Minor type design changes are automatically considered not significant under 21.101(b) and the existing type-certification basis is considered adequate for their approval under 21.95.

d. *Reserved*.

e. For the purpose of this GM, the term aeronautical products, or products, means type-certificated or restricted type-certificated aircraft, engines, and propellers or ITSO approved APUs.

f. This GM is not intended to be used to determine the applicable environmental protection requirements (aircraft noise, fuel venting and exhaust emission requirements) for changed products.

4. Definitions and Terminology

**Adequate Type-certification Basis** – The type-certification basis for a changed product under 21.101is considered adequate when the DGCA determines that it provides adequate standards for the design change, i.e. when the requirements of the applicable airworthiness code and prescribed special conditions provide an appropriate level of safety for the changed product and do not result in any unsafe design features.

**Aeronautical product** – The terms aeronautical product or product(s) used in this guidance material include type-certificated or restricted type-certificated aircraft, engines, propellers and ITSO approved Auxiliary Power Units (APUs).

**Affected area, system, part or appliance** – any system, part, or appliance which is either physically altered by a proposed design change or, even if not altered physically, its functional characteristics are altered due to the effects of the physical change.

**Design change** – A change in the type design of an aeronautical product. In the context of this document the terms 'change', 'design change' and 'type design change' are synonymous.

**Earlier requirements**– The requirements of the applicable airworthiness code in effect prior to the date of application for the change, but not prior to the existing type-certification basis.

**Existing type-certification basis** – The requirements of the applicable airworthiness code, special conditions and equivalent level of safety findings incorporated by reference in the type-certificate of the product to be changed.

**Latest requirements**– The requirements of the applicable airworthiness code in effect on the date of application for the change.

**Previous relevant design changes** – Previous design changes, the cumulative effect of which could result in a product significantly or substantially different from the original product or model, when considered from the last time the latest airworthiness codes were applied.

**Product level change** – A change or combination of changes that makes the product distinct from other models of the product (for example, range, payload, speed, design philosophy). Product level change is defined at the aircraft, engine, propeller, or APU level of change.

**Secondary change** – A change is a secondary change if compliance to the latest amendment would not contribute materially to the level of safety and where it is part of and consequential to an overall significant change. A secondary change is a physical change that restores without changing the system, structural capacity, or functionality, but is necessary to support a significant change.

**Significant change** – A change to the type-certificate significant to the extent that it changes at the product level one or more of the following: general configuration, principles of construction, or the assumptions used for certification, but not to the extent to be considered a substantial change. The significance of the change must be considered in the context of all previous relevant design changes and all related revisions to the applicable airworthiness codes. Not all product level changes are significant.

**Significant change in an area** (for excepted aircraft under 21.101(c) only) – A change in an area is significant if the general configuration or the principles of construction in that area are not retained, or the assumptions used for certification of that area do not remain valid.

**Substantial change** – A change which is so extensive that a substantially complete investigation of compliance with the applicable type-certification basis is required, and consequently a new type certificate, in accordance with 21.19.

**Type-certification basis** – The requirements of the applicable airworthiness code as established in 21.17 and 21.101, as appropriate; special conditions; and equivalent level of safety findings applicable to the product to be certificated.

## Chapter 2. Overview of 21.19 and 21.101

**1. 21.19**

a. 21.19 requires an applicant to obtain a new type-certificate (TC) for a changed product if the change in design, power, thrust, or weight is found by the DGCA so extensive that a substantially complete investigation of compliance with the applicable type-certification basis is required.

b. Changes that require a substantial re-evaluation of the product's compliance findings are referred to as 'substantial changes'. For guidance, see Section 3 of Chapter 3. Appendix A to this GM provides examples of type design changes that will require application for a new TC.

c. If the DGCA has determined through 21.19that the proposed design change does not require a new TC, see 21.101 for the applicable implementing rules to establish the type-certification basis for the proposed design change. For guidance, see Chapter 3 and the examples in Appendix A of this GM.

**2. 21.101**

a. 21.101(a) requires a change to a TC to comply with the requirements of the airworthiness code that is applicable to the changed product and that is in effect at the date of the application for the change, unless the change meets the criteria for the exceptions identified in 21.101(b) and (c) or compliance with airworthiness codes of later effective amendments is chosen by the applicant or required under 21.101(e) and (f). The intent of 21.101is to enhance safety through the incorporation of the latest regulatory standards in the type-certification basis for changed products to the greatest extent practicable.

b. An applicant can comply with airworthiness codes of an earlier amendment of the airworthiness code consistent with the requirements of 21.101(b), when:

- a change is not significant (see 21.101(b)(1)), or
- an area, system, part or appliance is not affected by the change (see 21.101 (b) (2)), or
- compliance with the latest amendment for a significant change does not contribute materially to the level of safety (see 21.101(b)(3)), or
- compliance with the latest amendment would be impractical (see 21.101(b)(3)).

c. Note that earlier amendments may not precede the corresponding amendment of the airworthiness code incorporated by reference in the type-certificate.

d. 21.101(b)allows a changed product to comply with an earlier amendment of the applicable airworthiness code, provided one of the criteria in 21.101(b)(1),(2) or (3) are met and the earlier amendment is considered adequate. However, when a proposed design change involves features or characteristics considered novel or unusual, or the intended use of the changed product is unconventional, or experience from other similar products in service or products having similar design features has shown that unsafe conditions may develop, and the proposed airworthiness standards do not contain adequate or appropriate standards for the changed product, later amendments and/or special conditions will be applied.

e. 21.101(b)(1)(i) and (ii) describe the automatic criteria establishing that a change is significant.

f. 21.101(c)provides an exception from the requirements of 21.101(a)for a change to certain aircraft with less than specified maximum weight. If an applicant applies for a type design change to an aircraft (other than rotorcraft) of 2 722 kg (6 000 pounds) or less maximum weight, or to a non-turbine powered rotorcraft of 1 361 kg (3 000 pounds) or less maximum weight, the applicant can demonstrate that the changed product complies with the type-certification basis incorporated by reference in the TC. The applicant can also elect to comply, or may be required to comply, with a later amendment. See Chapter 4, Section 2 in this GM for specific guidance on this provision.

g. 21.101(d)provides for the use of special conditions, under 21.16B, when the proposed amendment of the applicable airworthiness code and any later amendment do not provide adequate standards to the proposed change.

h. 21.101(e)prescribes the effective period an application will remain valid for a change. This section is consistent with the requirements of 21.17 for a new TC.

i. 21.101(f)requires that if an applicant chooses (elects) to comply with a requirement of an amendment to the airworthiness codes that is effective after the filing of the application for a change to a type, the applicant shall also comply with any other airworthiness codes that the DGCA finds is directly related.

## Chapter 3. The process for establishing the type-certification basis for changed products 21.101 (a) and (b)

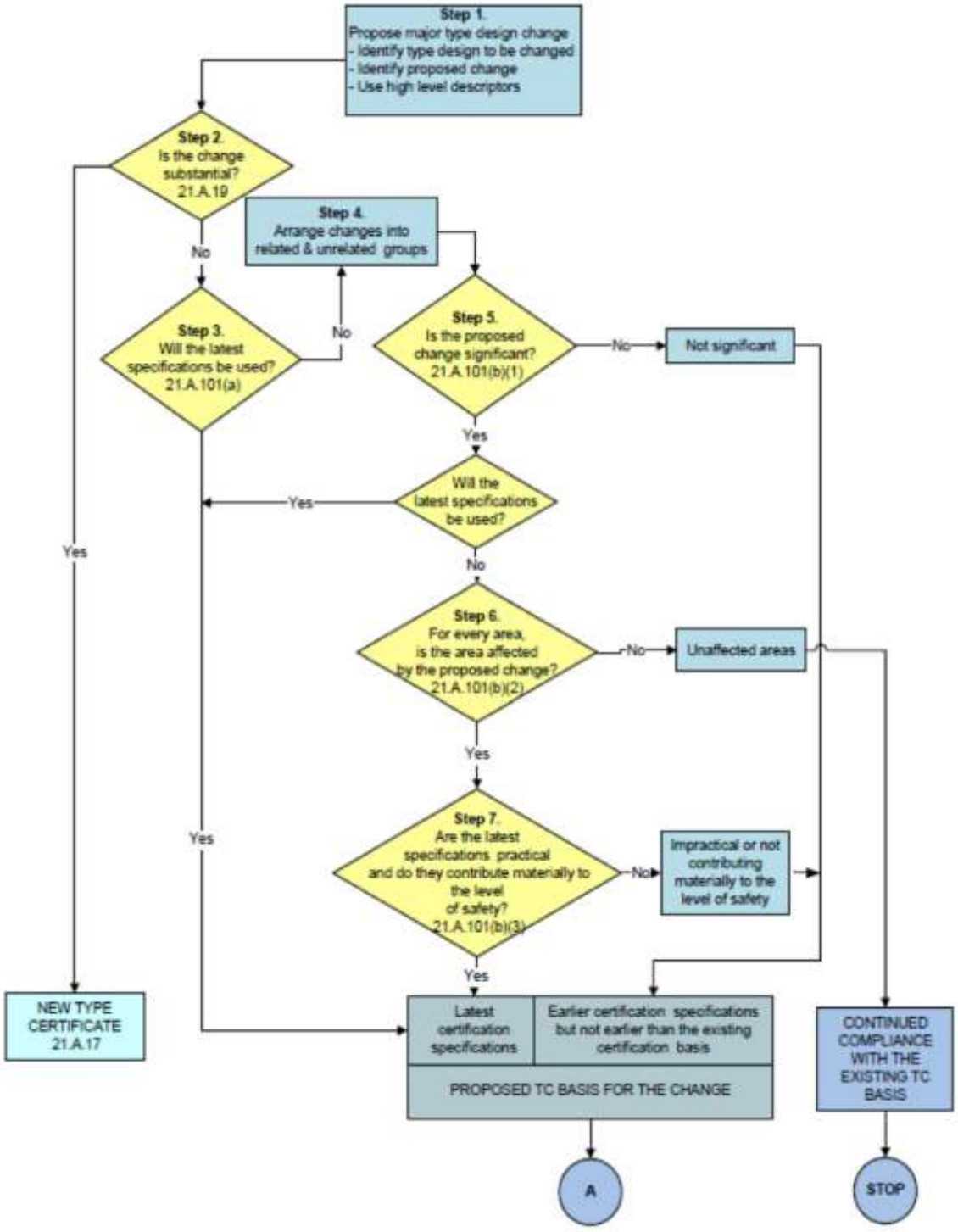
1. **Overview**

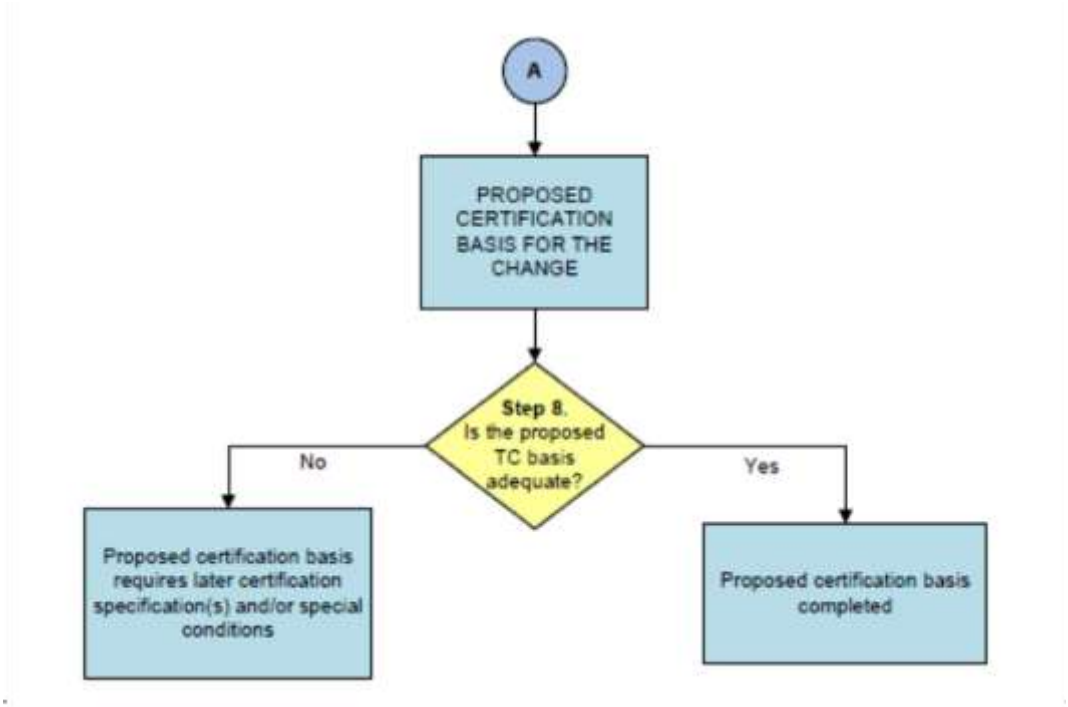
a. Both the applicant and the DGCA have responsibility under 21.101(a) and (b). The applicant must demonstrate that the change complies with the latest applicable airworthiness codes unless use of an exception per 21.101(b) is justified. If an exception is proposed, the applicant should make a preliminary classification whether the change is significant or not significant, and propose an appropriate type-certification basis. The DGCA determines whether the applicant's classification of the change and proposal for the type-certification basis are consistent with the applicable rules and their interpretation, but should not be dependent on whether the TC holder or applicant for a STC is originating the change. The type-certification basis can vary depending on the magnitude and scope of the change. The steps below present a streamlined approach for making this determination. In addition to assisting in the determination of significance and establishing the type-certification basis, this guidance will help to establish the appropriate amount of coordination required between the applicant and the DGCA.

b. Classifications of typical type design changes are in Appendix A, *Classification of Changes*. See paragraph 6(c) of this chapter for instructions on how to use Appendix A.

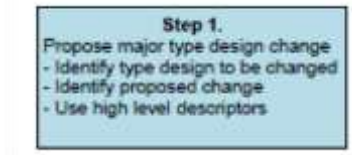
**c.** In cases where the examples in Appendix A are not applicable for the proposed change, use the following steps in conjunction with Figure 1 on the next page to establish the appropriate type-certification basis for the type design change.

Figure 1. Establishing the type-certification basis for a changed product






**2. Step 1 of Figure 1. Identify the proposed type design change to an aeronautical product**




a. Prior to describing the proposed change(s), it is important to clearly identify the type design configuration to be changed. A series of derivative aircraft, engines, or propellers (for example, x-100, x-200, x-300) may evolve based on predecessor type designs, each with its own design changes that make it distinct from the other series. The applicant should identify which model or series within that model is the specific configuration that will be modified.

Note: An STC is not a product; it is a change to a product. When changing or amending an STC the starting point is the existing modified product (TC with existing STC installed). For example, if an applicant were amending an STC for an external cargo locker and the applicant proposed changing the configuration of the locker, then the starting point would be the existing TC with the existing STC installed. The applicant would then compare that configuration (TC with existing STC installed) to the changed product (TC with proposed amended STC installed).

b. Changes to a product can include physical design changes, changes to an operating envelope and/or performance changes. The change can be a single change or a collection of changes. The purpose of this process step is to identify and describe the

change to the aeronautical product. The applicant for a type design change should consider all previous related design changes and the amendment level of the type-certification basis for these changes.

Note 1: By definition all previously incorporated changes have been approved. The purpose of step 1 is to consider the net cumulative effect of the changes since the last time the certification basis for the changed/affected area was upgraded from that of the original type design.

Note 2: Substantiating data for the proposed type design change can include compliance findings from a previously approved design change, in supporting compliance findings for the proposed change. However, for the purpose of classifying the proposed design change, such previously approved design and compliance data should be now considered in relation to the proposed type design change and should be taken into account as a part of the proposed design change classification.

c. When identifying the changes being proposed as part of a modification, consider previous relevant changes that create a cumulative effect, as these may influence the decisions regarding substantial and significant changes later in the process. By previous relevant changes those design changes are meant whose effects accumulate, such as successive thrust increases, incremental weight increases, or sectional increases in fuselage length. Any previous relevant design changes in the area affected by the current change that did not involve an upgrade of the existing type-certification basis should be taken into account in the next design change proposal.

   (1) **Example 1:** A 5 % weight increase is currently being proposed, but a previous 10 % and another 15 % weight increase has been incorporated into this aircraft without upgrading the existing type-certification basis. In the current proposal for a 5 % weight increase, the cumulative effects of the two previous weight increases that did not involve upgrade of the type-certification basis will now be accounted for as an approximately 30 % increase in weight, for the purpose of making the substantial and/or significant decisions. Note that the cumulative effects to be considered are only those incremental increases from the last time the applicable airworthiness codes in the type-certification basis were upgraded.

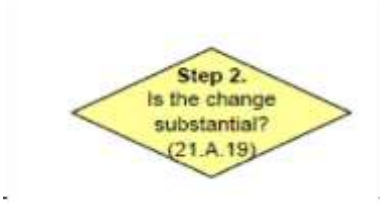
   (2) **Example 2:** The TC for aeroplane model X lists three series, namely X-300, X-200, and X-100. The X-300 is a derivative of the X-200 which is a derivative of the original X-100 series. An applicant proposes a design change to the X-300 series aeroplane. During the review of the X-300 type-certification basis and the airworthiness codes affected by the proposed change, it was identified that one airworthiness code, CS-25.571 (damage tolerance), remained at the same amendment level as the X-100 original type-certification basis (derogation from 21.101(a) was allowed). Since the amendment level for this particular airworthiness code was not changed for the two subsequent aeroplane series (X-200 and X-300), the cumulative effects of these two previous design changes that are related to the proposed change and the damage tolerance requirements should now be addressed.

d. To identify and describe the proposed changes to any aeronautical product, use a high-level description of the design change that characterises the intent of, or the reason for, the change. No complex technical details are necessary at this stage. For example, a proposal to increase maximum passenger-carrying capacity may require

an addition of a fuselage plug, and as such a 'fuselage plug' becomes one possible high-level description of this design change. Similarly, a thrust increase, a complete new interior, an avionics system upgrade, or a passenger-to-cargo conversion are all high-level descriptions that characterise typical changes to the aircraft, each driven by a specific goal, objective or purpose.

e. Evolutionary Changes. Evolutionary changes that occur during the course of a certification programme may require re-evaluation of the type-certification basis and may result in re-classification of the change. That is, any evolution in the proposed design change after the type-certification basis has been agreed to (or established) will necessitate a revisit of the type-certification basis to ensure that 'evolved' aspects of the design change are still covered by the agreed upon certification basis.

**3. Step 2 of Figure 1. Is the change substantial?**




a. 21.19 requires an applicant to apply for a new TC for a changed product if the proposed change in design, power, thrust, or weight is so extensive that a substantially complete investigation of compliance with the applicable type-certification basis is required. A new TC could be required for either an extensive change to a previously type-certificated product or for a changed design derived through the cumulative effect of a series of design changes from a previously type-certificated product.

b. A 'substantially complete investigation' of compliance is required when most of the existing substantiation is not applicable to the changed product. A substantial change proposal will require the need to comply with all the airworthiness codes applicable to a particular category of product. The number of airworthiness codes to which compliance must be re-established for the changed product may not necessarily be the sole determination criteria as to whether the change is substantial, but rather the extent of effort to establish compliance, or the depth of investigation required to be done. In other words, the design change may be considered substantial if it is so extensive (making the product sufficiently different from its predecessor) that the design models, methodologies and approaches used to demonstrate a previous compliance finding could not be used.

c. To address the question if a change is substantial at the beginning of the process, the applicant should evaluate the total or combined effect of all the proposed changes identified in Step 1, including the cumulative effects of previous relevant design changes since the last update of the type-certification basis (as explained in Step 1).

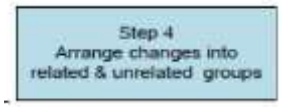
d. If it is not initially clear that a new TC is required, Appendix A provides some examples of substantial changes to aid in this classification. A substantial change requires application for a new TC under 21.17 and 21.19. If the change is not substantial, then follow the 21.101 process.

**4. Step 3 of Figure 1. Will the latest airworthiness codes be used?**




a. The applicant can upfront elect to use the latest airworthiness codes for their proposed type design change. If the latest airworthiness codes are used, the applicant will meet the intent of 21.101and no further classification (significant or not significant) and justification is needed. However, the decision to voluntarily comply with the latest airworthiness codes for a design change sets a new regulatory baseline for all future related changes in the same affected area. Even though one applicant elects to use the latest airworthiness codes, another applicant could apply 21.101for a similar design change proposal, and use the exceptions in accordance with 21.101(b). If the latest airworthiness codes are not used, then proceed as follows:

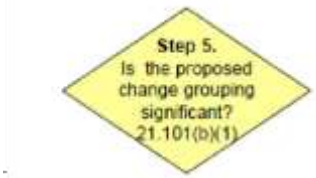
**5. Step 4 of Figure 1. Relation of changes**




a. Once the proposed changes are identified using high-level descriptions, the next step is to determine if any of these changes are related to each other. Related changes are those that cannot exist without one another, are co-dependent, or a prerequisite of one another. For example, a need to carry more passengers could require the addition of a fuselage plug, which will result in a weight increase, and may necessitate a thrust increase. Thus the fuselage plug, weight increase and thrust increase are all related high-level changes that will be needed to achieve the goal of carrying more passengers. A decision to upgrade the cockpit to more modern avionics at the same time as these other design changes may be considered unrelated, as the avionics upgrade is not necessarily needed to carry more passengers (it has a separate purpose, likely just modernisation). The proposed avionics upgrade would then be considered an unrelated (or a stand-alone) change. However, the simultaneous introduction of a complete new interior may be considered related since a cabin length change will have an impact on occupant safety considerations. Even if a new cabin interior is not included in the product level change, the functional effect of the fuselage plug has implications on occupant safety (e.g., the dynamic environment in an emergency landing, emergency evacuation, etc.), and thus the cabin interior becomes an affected area.
b. Once the change(s) are organised into groupings of those that are related and those that are unrelated (or stand-alone), the applicant is ready for Step 5 of Figure 1. The grouping of related and unrelated changes is particularly relevant to the 'significant' Yes/No decision, (21.101(b)(1)), described in Step 5 of Figure 1. Each group of related changes and each unrelated (stand-alone) change is evaluated on its own merit for significance.
c. After describing the groupings and the associated or supporting technical details for each change, the applicant should identify areas, systems, parts or appliances of the

product that are affected by the design change and the corresponding airworthiness codes associated with these areas. For each group, the applicant should assess the physical and/or functional effects of the change on other areas, systems, parts, or appliances of the product. The characteristics affected by the change are not only physical changes, but also functional changes brought about by the physical changes. Examples of physical aspects are: structures, systems, parts and appliances, software in combination with the affected hardware. Examples of functional characteristics are performance, handling qualities, aeroelastic characteristics, and emergency egress. The intent is to encompass all aspects where there is a need for re-evaluation, that is, where the substantiation presented for the product being changed should be updated or rewritten.

**6. Step 5 of Figure 1. Is the proposed change significant?**




a. In Step 5 it is the applicant's responsibility to justify that a grouping of related changes or an unrelated change does not qualify as a significant change. Significant changes are product level changes which are distinct from the vast majority of major changes. In general, these changes are either the result of an accumulation of changes or occur through an isolated extensive change that makes the changed product distinct from its predecessors. Step 1 explains the accumulation of changes that should be considered.

21.101(b)(1)defines a significant change as existing when one or more of three automatic criteria apply:

(1) **Changes where the general configuration is not retained (significant change to general configuration)**. A change to the general configuration at the product level that distinguishes the resulting product from other product models, for example performance or interchangeability of major components. Typically, for these changes an applicant will designate a new aircraft model number, although this is not required. For examples, see Appendix A to this GM.

(2) **Changes where the principles of construction are not retained (significant change to principles of construction)**. A change at the product level to the materials and/or construction methods that affect the overall products' operating characteristics or inherent strength and would require extensive reinvestigation to demonstrate compliance. For examples, see Appendix A to this GM.

(3) **Changes that invalidate the assumptions used for certification (significant change to the assumptions used for certification)**. A change to the assumptions at the product level associated with the compliance demonstration,

performance or operating envelope that by itself is so different that the original assumptions or methodologies of demonstrating compliance are invalidated. For examples, see Appendix A to this GM.

Note: The word 'assumptions' in 21.101 bears a meaning different from CS E-30 and CS-P-30. CS-E and CS-P address the conditions that may be imposed on the engine or propeller when it is eventually installed in the aircraft and are published in the installation manual.

b. The above criteria are used to determine if each change grouping and each stand-alone change is significant. These three criteria are assessed at the product level. In applying the automatic criteria the applicant should focus on the design change itself. Consideration of only the regulatory importance or safety benefit of the latest airworthiness codes is not a justification by itself to cause a design change to be classified or re-classified as a significant change.

c. Appendix A includes tables of typical changes for large aeroplanes, small aeroplanes, rotorcraft, and engines/propellers that meet the definition of significant. The appendix also includes typical changes that do not achieve the significant level. In these tables, one or more of the three automatic criteria in 21.101(b)(1) apply for each case where the changes are identified as significant. Experience has shown the concept of having only the three automatic criteria seems to fit most projects. The tables can be used in one of two ways:

(1) To classify a proposed change that is listed in the table, or

(2) In conjunction with the three automatic criteria, to help classify a proposed change not listed in the tables of the appendix by comparing the proposed change to changes which are similar in type and/or magnitude.

d. Design changes can trigger one or more of the automatic criteria listed in 21.101(b)(1)(i) and (ii) for the proposed design change. When assessing the design change grouping, consider the cumulative effect of previous relevant design changes. Design changes may have been incorporated over time with no change in the type-certification basis and the final product may be significantly different than would be represented by the existing type-certification basis.

e. Each grouping of related changes and each unrelated (stand-alone) change, identified using high-level descriptions, will be evaluated to determine if it is a significant or not significant change. Use the tables in Appendix A as guidance to make the classification of significant or not significant. Only when one or more of the three criteria is met, the type design change can be considered significant for that grouping or unrelated change. The starting point for assessing the cumulative effects of previous relevant design changes is from the last time the applicable airworthiness codes in the type-certification basis for the affected area, system, part, or appliance were upgraded.

f. Typically, a change to a single area, system, part or appliance may not result in a product level change. However, there may be distinct cases where the change to a single system or part may, in fact, result in a significant change due to its effect on the product overall. Examples may include addition of winglets, leading edge slats or change in primary flight controls to fly-by-wire system.

g. A change is a secondary change if compliance to the latest amendment does not contribute materially to the level of safety and where it is part of and consequential to an overall significant change. A secondary change is a physical change that restores without changing the system, structural capacity or functionality, but is necessary to support a significant change. Based on this description, a secondary change is not required to comply with the latest airworthiness codes because it is considered 'not contributing materially to the level of safety', and therefore eligible for an exception under 21.101(b)(3). Determining whether a change meets the description for secondary change, and thus is eligible for an exception, should be straightforward. Hence the substantiation or justification need only be minimal. If this determination is not straightforward, then the proposed change is very likely not a secondary change.

(1) In some cases the change which restores functionality may in fact contribute materially to the level of safety by meeting a later amendment. If this is the case, it would not be considered a secondary change.

(2) An example of secondary change is lengthening existing control cables passing through the new fuselage plug to restore existing functions to systems that could be situated within or beyond the new plug. The lengthening of these cables can be accepted as not adding system capacity or capability, so these changes can be identified as secondary changes and not be required to meet the latest amendment.

h. A new model number designation to a changed product is not necessarily indicative that the design change is significant under 21.101. Conversely, retaining the existing model designation does not mean that the design change is not significant. All changes are considered in light of the magnitude of the type design change.

i. Making the determination. The final determination of whether a design change is significant or not significant is retained by the DGCA. To assist the applicant in their assessment, the DGCA has predetermined the classification of several typical design changes that can be used for reference, and these examples are listed in Appendix A to this GM.

j. At this point, the determination of significant or not significant for each of the groupings of related changes and each stand-alone change has been made. For significant changes, if the applicant proposes to comply with an earlier requirement, the procedure outlined in paragraph 7 below should be used.

**7. Proposing an amendment level for a significant change**

a. If an unrelated (stand-alone) change or a grouping of related changes is classified as significant, the applicant will comply with airworthiness codes of the latest amendment of the applicable airworthiness code for certification of the changed product, unless the applicant can justify use of one of the exceptions provided in 21.101(b)(2) and/or (3) to demonstrate compliance with earlier amendment(s). The final type-certification basis may consist of a combination of airworthiness codes of the applicable airworthiness code at different amendment levels ranging from the original type-certification basis to the most current amendments.

b. If the classification of the change is significant, all areas, systems, parts or appliances affected by the change must comply with requirements of the applicable airworthiness code at the amendment level in effect on the date of application for the change. The applicant will need to show that an area, system, part or appliance

is not affected by the change to justify use of the exception in 21.101(b)(2) (see Section 9 for guidance on whether or not an area is affected by the proposed change).

c. *Reserved*.

d. 21.101(b)(3) provides two more exceptions applicable to areas, systems, parts or appliances which are affected by the significant change but for which compliance with the latest airworthiness codes would either not contribute materially to the level of safety or would be impractical (see Section 10 for more guidance).

e. *Reserved*.

f. The applicant should provide acceptable justification for the application of earlier amendments for areas affected by a significant change. Your justification should show that compliance with later amendment in these areas would not contribute materially to the level of safety or would be impractical. Such justification should address all the aspects of the area, system, part or appliance affected by the significant change.

g. The final type-certification basis may combine airworthiness codes at the latest amendment level, earlier (intermediate) amendment levels, and the amendment level of the existing type-certification basis, but cannot contain airworthiness codes preceding the existing type-certification basis.

h. Note that should an applicant decide to use the latest airworthiness codes without any exceptions, no further evaluations and justifications are needed. In such a case, proceed to step 8 (Section 11).

**8. Proposing an amendment level for a not significant change**

a. When a change is classified not significant, the rule (21.101(b)(1)) allows the use of the earlier airworthiness codes, but not dated prior to the existing type-certification basis. Within this limit, the applicant is allowed to propose an amendment level for each airworthiness code for the affected area. However, the applicant should be aware that their proposal for the type-certification basis will be reviewed by the DGCA to ensure that the type-certification basis is adequate for the proposed change (see paragraph 8.d).

b. *Reserved*

c. When choosing the above option of the existing type-certification basis, an applicant can elect to comply with a specific airworthiness code or a subset of airworthiness codes at later amendments. In such a case, the applicant should consult with the DGCA to ensure the type-certification basis includes other airworthiness codes that are directly related. Some later airworthiness codes may be less restrictive; therefore, the applicant may see advantage in using them on the elect to comply basis. However, the applicant is recommended not to make a final decision until they have learned from the DGCA which other airworthiness codes are considered directly related.

d. For a design change that contains features which are not covered in the proposed type-certification basis, i.e. when the type-certification basis is not considered 'adequate' (see the definition of 'adequate type-certification basis' in Chapter 1, Section 4), the DGCA will designate the applicable airworthiness codes at the appropriate amendment level, beginning with the existing type certification basis and progressing to the most appropriate later amendment level for the change. For

a change that contains new design features that are novel or unusual, for which there is no later applicable airworthiness codes, the DGCA will designate special conditions.

**9. Step 6 of Figure 1. Is the area affected by the proposed change?**




a. An unaffected area is any area, system, part, or appliance that is not affected by the proposed type design change. For a type design change, it is important that the effects of such change on other areas, systems, parts, or appliances of the product are properly assessed because areas that have not been physically changed may still be considered part of the affected area. If a new compliance finding is required, regardless of its amendment level, it is an affected area. If the significant change does not affect the area, then the type-certification basis of that area does not need to be revisited, in other words, the unaffected area continues to comply with the existing amendment level without further substantiation.

b. To determine whether an area is affected or not, consider the following aspects of a type design change:

(1) Physical aspects. The physical aspects include direct changes to structures, systems, parts, and appliances (physical aspects may include software/airborne electronic hardware changes and the resulting effect on systems functions).

(2) Performance/functional characteristics. The less obvious aspect of the word 'areas' covers general characteristics of the type-certificated product, such as performance features, handling qualities, emergency egress, structural integrity, aeroelastic characteristics, or crashworthiness. These characteristics may be affected by a product level change. For example, adding a fuselage plug could affect performance and handling qualities, and thus specifications associated with these aspects would be considered part of the affected area. Another example is the addition of a fuel tank and new fuel conditioning unit. This change affects the fuel transfer and fuel quantity indication system resulting in the aeroplane's unchanged fuel tanks being affected. Thus, the entire fuel system (changed and unchanged areas) becomes part of the affected area due to the change in functional characteristics.

Note: Substantiating data for the affected area for a proposed type design change can include compliance findings from a previously approved design change, in supporting compliance findings for your proposal. However, your proposal to use previously approved compliance data must be considered part of the entire proposed type design change and should be approved as part of your proposed design change.

c. All areas affected by the proposed design change must comply with the latest airworthiness codes, unless the applicant can show that demonstrating compliance with the latest amendment of an airworthiness code would not

contribute to the level of safety or would be impractical. Step 7 provides further explanation.

**10. Step 7 of Figure 1. Are the latest airworthiness codes practical and do they contribute materially to the level of safety?**




**a. Contribute materially to the level of safety.** Compliance with the latest airworthiness codes could be considered not to contribute materially to the level of safety if the existing type design and/or relevant experience demonstrates a level of safety comparable to that provided by the latest airworthiness codes. The applicant should provide sufficient justification to allow the DGCA to make this determination. This exception could be applicable in the situations described in the paragraphs below:

Note: Compliance with later airworthiness codes would not be required where the amendment is of administrative nature and has been made only to correct inconsequential errors or omissions, consolidate text, or clarify an existing airworthiness code.

(1) Design features that exceed the existing type-certification basis specifications, but do not meet the latest airworthiness codes, can be used as a basis for granting an exception under the 'does not contribute materially' exception. These design features, if accepted as a justification for an exception, must be incorporated in the amended type design configuration and recorded in the TCDS or STC, where necessary, as an integral part of the type-certification basis. For example1, an applicant proposes to install winglets on a FAR Part-25 airplane. Part of the design involves adding a small number of new wing fuel tank fasteners. The latest § 25.981 at amendment 25-102 requires structural lightning protection. The applicant proposes an exception from these latest structural lightning protection airworthiness codes because the design change uses new wing fuel tank fasteners with cap seals installed. The cap seal is a design feature that exceeds the requirement of § 25.981 at a previous amendment level, but does not meet the latest amendment 25-102. If the applicant can successfully substantiate that compliance with amendment 25-102 would not materially increase the level of safety of the changed product, then this design feature can be accepted as an exception to compliance with the latest amendment.

(2) Consistency of design should be considered when applying the latest airworthiness codes. Below, an aeroplane example is provided for describing how this provision may be used; however, the rationale in this example may be applied to any product covered by this GM.

- For example, when a small fuselage plug is added, additional seats and overhead bins are likely to be installed, and the lower cargo hold extended. These components may be identical to the existing components. The level of safety may not materially increase by applying the latest airworthiness codes.

- However, if a fuselage plug is large enough in relation to the original certificated aircraft structure, seats, bins, doors, and cargo compartment, the change may require compliance with the latest airworthiness codes, comparable with what will be required for a new aeroplane. In these circumstances the proposed type-certification basis should encompass the airworthiness codes in effect on the date of application for the change.

(3) Service experience: Relevant service experience, such as fleet performance or utilisation over time (relevant flight hours or cycles), is one way of showing that a later amendment may not contribute materially to the level of safety, so the use of earlier airworthiness codes could be appropriate. Appendix C provides additional guidance on the use of service experience, along with examples.

- There may be cases for rotorcraft and small aeroplanes where relevant data may not be sufficient or not available at all because of the reduced utilisation and the different amount and type of data available. In such cases, other service history information may provide sufficient data to justify the use of earlier airworthiness codes, such as: warranty, repair, and parts usage data; accident, incident, and service difficulty reports; Service Bulletins; airworthiness directives; or other pertinent and sufficient data collected by the manufacturers, authorities, or other entities.
- The service experience levels necessary to demonstrate the appropriate level of safety as they relate to the proposed design change would have to be reviewed and agreed to by the DGCA.

**b. Impractical.** Compliance with the latest airworthiness codes may be considered impractical if the applicant can justify that it would result in additional resource requirements that are not commensurate with the incremental safety benefit (difference between the latest and the proposed type-certification basis). The additional resource requirements could include those arising from design changes required for compliance and the effort required to demonstrate compliance, but excludes resource expenditures for prior product changes.

(1) The position that compliance is impractical should be supported with a substantiating data and analyses. While evaluating the applicant's position and their substantiating data regarding impracticality, the DGCA may consider other factors (for example, the costs and safety benefits for a comparable new design).

(2) A review of large aeroplane projects showed that in certain cases, where an earlier amendment to applicable airworthiness codes was allowed, design changes were made to nearly comply with the latest amendments. In these cases, the applicants were able to successfully demonstrate that full compliance would require a substantial increase in the outlay or expenditure of resources with a very small increase in the level of safety. These design features can be used as a basis for granting an exception under the 'impracticality' exception.

(3) Appendix B provides additional guidance and examples for determining procedures for evaluating impracticality of applying latest airworthiness codes to a changed product rule.

a) The exception of impracticality is a qualitative and/or quantitative cost/safety benefit assessment for which it is difficult to specify clear criteria. Experience to date with applicants has shown that justification of impracticality is more feasible when both applicant and authority agree at an earlier discussion that the effort (in terms of cost, changes in

manufacturing, etc.), required to comply would not be commensurate with a small incremental safety gain. This would be clear even without the need to perform any detailed cost/safety benefit analysis (although cost analysis could always be used to support an appropriate amendment level).

Note: The impractical exception should not be based on the size of the applicant's company or their financial resources. Costs to comply with a later amendment should be evaluated against the safety benefit of complying with the later amendment. Applicants that may not be able to afford the cost because of reasons such as fewer resources, will not be granted the impractical exception when the cost is comparable to the safety benefit achieved by complying with a later amendment.

b) For example, a complex redesign of an area of the baseline aircraft may be required to comply with a new airworthiness code, and that redesign may make the changed product uncommon with respect to design and manufacturing processes from the existing family of derivatives. Relevant service experience of the existing fleet of the baseline aircraft family would be required to show that there has not been a history of problems associated with the hazard that the new amendment in question was meant to address. In this way, the incremental cost/impact to the applicant is onerous and the incremental safety benefit that would be realised by complying with the later amendment would be minimal, and this would be justified with a demonstrated acceptable service experience in relation to the hazard that the new airworthiness code addresses.

**11. Step 8 of Figure 1. Is the proposed type-certification basis adequate?**




a. Regardless of whether the change is significant or not, the applicant's proposed type- certification basis may be deemed inadequate – that is, the change includes features or characteristics that were not foreseen during the initial (or previously approved) type- certification. These features or characteristics, if not adequately addressed, may make the product unsafe for the uses for which certification is requested. This would obstruct issuance of the requested approval for the change. The change must comply with later standards (such as, a later amendment or a special condition). An example is adding a flight critical system such as an electronic air data display on FAR/CS-25 aeroplane whose existing type-certification basis did not have lightning protection airworthiness codes. In this case, compliance with the airworthiness code for lightning protection will be required, even though this is not a significant change.

b. In cases where inadequate or no airworthiness standards exist for the change in the proposed type-certification basis, but adequate standards exist in a subsequent

amendment of the applicable airworthiness code, the subsequent amendment will be made part of the type-certification basis to assure its adequacy.

c. In cases where no adequate standard exists in any subsequent amendment of the applicable airworthiness code because of one or more reasons specified in 21.16B(a), the DGCA will prescribe special conditions containing necessary safety standard per 21.16B(b). 21.101(d) allows for the application of special conditions, or for changes to the existing special conditions, to address the changed designs where the proposed type-certification basis does not provide adequate standards with respect to the proposed change. Reference Section 3 of Chapter 4 for additional information pertaining to special conditions.

d. *Reserved*

e. The final type-certification basis may consist of a combination of the requirement of the applicable airworthiness code at different amendment levels ranging from the original type-certification basis to the most current amendments, and special conditions.

## Chapter 4. Other considerations

1. Design related operating requirements

The use of exceptions under 21.101 is not intended to alleviate or preclude compliance with applicable operating rules or directives that prescribe compliance with the applicable additional airworthiness (design-related) specifications for operations.

2. Excepted products under 21.101(c)

    a. An applicant for a design change to an excepted product may demonstrate that the changed product complies with the existing type-certification basis incorporated by reference in the TC. If the DGCA finds that the change is significant 'in an area', the DGCA will require compliance with a later amendment to the existing type-certification basis that applies to that affected area and any airworthiness code the DGCA finds is directly related. For excepted products, changes that meet one of the following criteria, in the area of change, are automatically considered significant if:

        - The general configuration or the principles of construction are not retained, or
        - The assumptions used for certification of the product to be changed do not remain valid.

    b. However, the DGCA may allow the applicant to comply with an earlier amendment to the airworthiness code initially designated or with the existing type-certification basis if the DGCA agrees to the applicant's justification.

    c. For a design change to an excepted product that contains new features, which are not covered in the existing type-certification basis, the DGCA will designate the applicable airworthiness codes at the appropriate amendment level, beginning with the existing type-certification basis and progressing to the most appropriate later amendment level for the change. For a change that contains new design features that are novel and unusual for which there are no later

applicable airworthiness codes at a later amendment level, the DGCA will designate special conditions per 21.101(d).

d. The exception provided for excepted products under 21.101(c) applies at the aircraft level only. Design changes to type-certificated engines and propellers installed on these excepted aircrafts are assessed as separate products using 21.101(a) and (b).

3. Special conditions, 21.101(d) allows for the application of special conditions, or for changes to existing special conditions, to address the changed designs where the proposed type-certification basis does not provide adequate standards for an area, system, part or appliance related to the change and no adequate standard exist in any subsequent amendment of the applicable requirement up to the airworthiness code in effect on the date of the application for the change. The objective is to achieve a level of safety consistent with that provided for other areas, systems, parts or appliances affected by the change by the other airworthiness codes of the proposed type-certification basis. The application of special conditions to a design change is not, in itself, a reason for it to be classified as either a substantial change or a significant change. When the change is significant with earlier airworthiness codes allowed through exceptions, or not significant, the level of safety intended by the special conditions should be consistent with the agreed type-certification basis. Note that special conditions may also be applied under 21.16B when the intended use of the changed product is unconventional or experience from other similar products in service or products having similar design features has shown that unsafe conditions may develop.

4. Effective period for an application to change a Type-Certificate (21.101(e))

Per 21.101(e), an application for, or a change to, a TC for large aeroplanes and large rotorcraft is effective for 5 years, and an application for a change to any other TC is effective for 3 years. This is intended to ensure that the type-certification basis for the changed product is as current as practical. According to 21.101(e)(1) and (2), in a case where the change has not been approved, or it is clear that it will not be approved under the time limit established under this subparagraph, the applicant may:

1. File a new application for a change to the type-certificate and comply with all the provisions of paragraph 21.101(a)applicable to an original application for a change; or

2. File for an extension of the original application and comply with the provisions of paragraph (a) for an effective date of application, to be selected by the applicant, not earlier than the date which precedes the date of approval of the change by the time period established under this subparagraph for the original application for the change.

This is consistent with the requirements of 21.17 for a new TC and defines the process of updating the type-certification basis if these time limits are exceeded.

5. Special purpose aircraft

When a change is proposed to aircraft which is designed or modified for a special purpose to operate in restricted airworthiness category (under a special certificate of airworthiness), the process of establishing the type-certification basis of the changed product is in principle the same as for aircraft with a standard certificate

of airworthiness. 21.101 is equally applicable to those special purpose aircraft, except that the applicable airworthiness codes, the proposed change must comply with, can exclude the paragraphs of the applicable airworthiness code that the DGCA finds inappropriate for the special purpose for which the aircraft is to be used and may include possible alternative specifications to address that special purpose. Nevertheless, the 'top-down' approach under 21.101(a) and (b) (and the guidance in Chapter 3 of this GM) generally applies also to special purpose aircraft unless the aircraft is meeting the criteria in 21.101(c) for excepted products, for which 'bottom-up' approach applies (see above Section 2 in this Chapter). All the exception routes under 21.101(b)(1), (2) and (3) are still available, in particular the 'not materially contributing to the level of safety' and 'impractical' exceptions may be found justifiable considering the intended special purpose of the aircraft.

6. During compliance demonstration, in case the applicant desires to take the credit of military certification approved data then the applicant shall require to comply with GM 21.20 (f).

7. Documentation.

All changes that result in a revision to the product's type-certification basis should be reflected on the amended TC or STC. The resulting type-certification basis should be retained as it forms part of the compliance record required by the applicable DGCA's internal working procedures.

**Appendix A to GM 21.101 Classification of Changes**

The following examples of substantial, significant and not significant changes are adopted by the Federal Aviation Administration (FAA), European Aviation Safety DGCA (EASA) and Transport Canada Civil Aviation (TCCA) through an international collaboration. The classification may change due to cumulative effects and/or combinations of individual changes. The 'N/A' indicated in the substantial example tables indicates 'Not Applicable' at the 21.19 'Substantial' evaluation phase.

## Table 1. Examples of changes for Small Aeroplanes:

The following examples are for **SUBSTANTIAL** changes for Small Aeroplanes (FAR/CS-23):

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)( i) | Is there a Change to the Principles of Construction? 21.101(b)(1)( i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)( ii) | Notes |
|---|---|---|---|---|
| Change in wing location (tandem, forward, canard, high/low) | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. |
| Fixed wing to tilt wing | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. |
| Increase in the number of engines from one to two | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. |
| Replacement of piston or turbo-prop engines with turbojet or turbofan engines | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. |
| Change in engine configuration (tractor to pusher) | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. |
| Change from an all metal airplane to all composite primary structure (fuselage, wing, empennage). | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. |
| Increase from subsonic to supersonic flight regime | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. |

The following examples are for **SIGNIFICANT** changes for Small Aeroplanes (FAR/CS-23):

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)(i) | Is there a Change to the Principles of Construction? 21.101(b)(1)(i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Conventional tail to T-tail or Y-tail, or vice versa | Yes | No | Yes | Change in general configuration. Requires extensive structural, flying qualities and performance re-investigation. Requires new AFM to address performance and flight characteristics. |
| Changes in wing configuration (addition of tail strakes or change in dihedral, changes in wing span, flap or aileron span, angle of incidence of the tail, addition of winglets, or wing sweep of more than 10% at the quarter chord | Yes | No | Yes | Change in general configuration . Likely requires extensive changes to wing structure. Requires new AFM to address performance and flight characteristics. Note: Small changes to wingtip are not significant changes. See table for not significant changes. |
| Tricycle / tail wheel undercarriage change or addition of floats | Yes | No | No | Change in general configuration. Likely, at airplane level, general configuration and certification assumptions remain valid. |
| Passenger to freighter configuration conversion which involves the introduction of a cargo door or an increase in floor loading of more than 20%, or provision for carriage of passengers and freight together | Yes | No | Yes | Change in general configuration affecting load paths, aero elastic characteristics, aircraft related systems, etc. . Change in design assumptions. |
| Replace reciprocating engines with the same number of turbo-propeller engines where the operating envelope is expanded | No | No | Yes | Invalidates certification assumptions. Requires new AFM to address performance and flight characteristics. |
| Addition of a turbo-charger that changes the power envelope, operating range, or limitations. | No | No | Yes | Invalidates certification assumptions due to changes in operating envelope and limitations. Requires new AFM to address performance and flight characteristics. |
| The replacement of an engine of higher rated power or increase thrust would be considered significant if it would invalidate the existing substantiation, or would | No | Yes | Yes | Invalidates certification assumptions. Requires new AFM to address performance and flight characteristics. Likely changes to primary structure. Requires extensive |

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| change the primary structure, aerodynamics, or operating envelope sufficiently to invalidate the assumptions of certification | | | | construction reinvestigation. |
| A change in the type of material, such as composites in place of metal (or one composite fiber material system with another (e.g., carbon for fiber glass), for primary structure would normally be assessed as a significant change. | No | Yes | Yes | Change in principles of construction and design from conventional practices. Likely change in design/certification assumptions. |
| Change involving appreciable increase in design speeds $V_d$, $V_{mo}$, $V_c$, or $V_a$ | No | No | Yes | Certification assumptions invalidated. Requires new AFM to address performance and flight characteristics. |
| Short take-off and landing (STOL) kit | No | No | Yes | Certification assumptions invalidated. Requires new AFM to address performance and flight characteristics. |
| A change in the rated power or thrust is likely to be regarded as significant if the design speeds are thereby changed so that compliance needs to be re-justified with a majority of requirements. | No | No | Yes | Certification assumptions invalidated. Requires new AFM to address performance and flight characteristics. |
| Fuel state: such as compressed gaseous fuels, or fuel cells. This could completely alter the fuel storage and handling systems and possibly affect the aeroplane structure. | No | No | Yes | Changes in design/certification assumptions. Extensive alteration of fuel storage and handling systems. |
| A design change that alters the aircraft flight characteristics or performance from the type design would normally be significant if it appreciably changes the kinematics or dynamics of the aeroplane. | No | No | Yes | Certification assumptions invalidated. Requires new AFM to address performance and flight characteristics. |
| A change in the flight control concept for an aircraft, for example to fly by wire (FBW) and side-stick control, or a change from hydraulic to electronically actuated flight controls, would in isolation normally be regarded as a significant change. | No | No | Yes | Changes in design and certification assumptions. Requires extensive systems architecture and integration re-investigation. Requires a new AFM. |
| Change to aeroplane's cabin operating altitude, or operating pressure | No | No | Yes | An increase greater than 10 % in maximum cabin pressure differential invalidates certification assumptions and the fundamental approach used in decompression, |

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| | | | | structural strength, and fatigue. |
| Addition of cabin pressurisation system | No | No | Yes | Extensive airframe changes affecting load paths, fatigue evaluation, aero elastic characteristics, etc. Invalidates design assumptions. |
| Changes in types and number of emergency exits or an increase in passenger capacity in excess of maximum passenger capacity demonstrated for the aircraft type. | Yes | No | Yes | Emergency egress requirements exceed those previously substantiated. Invalidates assumptions of certification. |
| A change in the required number of flight crew, which necessitates a complete cockpit rearrangement, and/or an increase in pilot workload would be a significant change. | No | No | Yes | Extensive changes to avionics and aircraft systems. Invalidates certification assumptions. Requires new AFM. |
| Expansion of an aircraft's operating envelope | No | No | Yes | An appreciable expansion of operating capability would normally be a significant change (e.g., an increase in maximum altitude limitation, approval for flight in known icing conditions, or an increase in airspeed limitations). Merely operating a product to an expanded envelope for which it was originally designed is generally not a significant change. In this case, the assumptions used for certification of the basic product remain valid and the results can be applied to cover the changed product with predictable effects or can be demonstrated without significant changes to the product. |
| Replacement of an aviation gasoline engine with an engine of approximately the same horsepower utilising diesel fuel | | | | A major change to the aeroplane. The general configuration and principles of construction will usually remain valid; however, the assumptions for certification are invalidated. |

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| Comprehensive flight deck upgrade, such as conversion from entirely federated, independent electro-mechanical flight instruments to highly integrated and combined electronic display systems with extensive use of software and/or complex electronic | No | No | Yes | Affects avionics and electrical systems integration and architecture concepts, or philosophies. |
| Introduction of autoland | No | No | Yes | Invalidates original design assumptions. |
| Airframe life extension | No | No | Yes | This modification pertains to fuselage and/or wing limits, and ageing aeroplane concerns. An increase from the original life limit which constitutes a re-evaluation of certification design assumptions. |
| Extensive structural airframe modification, such as a large opening in fuselage | Yes | No | No | Requires extensive changes to fuselage structure, affects aircraft systems, and requires a new AFM to address performance and flight characteristics. |
| Fuselage stretch or shortening in the cabin or pressure vessel | Yes | No | Yes | Cabin interior changes are related changes since occupant safety considerations are impacted by a cabin length change. Even if a new cabin interior is not included in the product level change, the functional effect of the fuselage plug has implications on occupant safety (e.g., the dynamic environment in an emergency landing, emergency evacuation, etc.), and thus the existing cabin interior becomes an affected area. |
| Conversion from normal category to commuter category aeroplane | Yes | No | Yes | In many cases this change could be considered a substantial change to the type design. Therefore, a proposed change of this nature would be subject to DGCA determination under 21.19. |

The following examples are for **NOT SIGNIFICANT** changes for Small Aeroplanes (FAR/CS-23):

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)(i) | Is there a Change to the Principles of Construction? 21.101(b)(1)(i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Addition of wingtip modifications (not winglets) | No | No | No | Although a major change to the airplane. Likely the original general configuration, principles of construction and certification assumptions remain valid. |
| Installation of skis or wheel skis | No | No | No | Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid. |
| FLIR or surveillance camera installation. | No | No | No | Additional flight or structural evaluation may be necessary but the change does not alter basic airplane certification. |
| Litter, berth and cargo tie down device installation | No | No | No | |
| Increased tire size, including tundra tires | No | No | No | |
| Replacement of one propeller type with another (irrespective of increase in number of blades) | No | No | No | Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid. |
| Addition of a turbocharger that does not change the power envelope, operating range, or limitations (e.g., a turbo—normalised engine), (e.g., where the additional power is used to enhance high altitude or hot day performance.) | No | No | No | |
| Substitution of one method of bonding for another (e.g., change in type of adhesive) | No | No | No | |
| Substitution of one type of metal for another | No | No | No | |
| Any change in construction or fastening not involving primary structure | No | No | No | |
| A new fabric type for fabric skinned aircraft | No | No | No | |
| Increase in flap speed or undercarriage limit speed | No | No | No | Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid. |
| Structural strength increases | No | No | No | Although a major change to the airplane, likely the original general |

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| | | | | configuration, principles of construction and certification assumptions remain valid. |
| IFR upgrades involving installation of components (where the original certification does not indicate that the aeroplane is not suitable as an IFR platform, e.g., special handling concerns). | No | No | No | |
| Fuel lines, where engine horsepower is increased but fuel flow is not increased beyond the certified maximum amount. | No | No | No | |
| Fuel tanks, where fuel is changed from gasoline to diesel fuel and tank support loads are small enough that an extrapolation from the previous analysis would be valid. Chemical compatibility would have to be substantiated | No | No | No | |
| Limited changes in a pressurisation system, e.g., number of outflow valves, type of controller, or size of pressurised compartment, but the system must be re-substantiated if the original test data is invalidated. | No | No | No | Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid. |
| Install a quieter exhaust system | No | No | No | |
| Changes in engine cooling or cowling | No | No | No | |
| Changing fuels of substantially the same type: Such as AvGas to AutoGas, AvGas (80/87) to AvGas (100LL), Ethanol to Isopropyl Alcohol, Jet B to Jet A (although Jet A to Jet B may be considered significant due to the fact that Jet B is considered potentially more explosive). | No | No | No | Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid. |
| Fuels that specify different levels of "conventional" fuel additives that do not change the primary fuel type. Different additives(MTBE, ETBE, Ethanol, Amines, etc.) in AvGas would not be considered a significant change. | No | No | No | Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid. |
| A change to the maximum take-off weight of less than 5% unless assumptions made in justification of the design are thereby invalidated. | No | No | No | Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid. |
| An additional aileron tab (e.g. on the other wing) | No | No | No | Although a major change to the airplane, likely the original general configuration, principles of |

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| | | | | construction and certification assumptions remain valid. |
| Larger diameter flight control cables with no change in routing, or other system design | No | No | No | |
| Autopilot installation (for IFR use, where the original certification does not indicate that the aeroplane is not suitable as an IFR platform) | No | No | No | Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid. |
| Increased battery capacity or relocate battery | No | No | No | |
| Replace generator with alternator | No | No | No | |
| Additional lighting (e.g., navigation lights, strobes) | No | No | No | |
| Higher capacity brake assemblies | No | No | No | |
| Increase in fuel tank capacity | No | No | No | Not a product level change, unless it is tied with an increase in gross weight. |
| Addition of an oxygen system | No | No | No | |
| Relocation of a galley. | No | No | No | |
| Passenger to freight (only) conversion with no change to basic fuselage structure. | No | No | No | Although a major change to the airplane, likely the original general configuration, principles of construction and certification assumptions remain valid. Requires certification substantiation applicable to freighter requirements. |
| New cabin interior with no fuselage length change | No | No | No | |
| Installation of new seat belt or shoulder harness | No | No | No | |
| A small increase in cg range. | No | No | No | At airplane level, no change in general configuration, principles of construction & certification assumptions. |
| APU Installation that is not flight essential | No | No | No | A major change to the airplane level, likely the original general configuration, principles of construction and certification assumptions remain valid. Requires certification substantiation applicable to APU installation requirements. |
| An alternative autopilot | No | No | No | |
| Addition of Class B Terrain Awareness and Warning Systems (TAWS) | No | No | No | |

## Table 2. Examples of changes for Large Aeroplanes (FAR/CS-25)

The following examples are for **SUBSTANTIAL** changes for Large Aeroplanes (FAR/CS-25):

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)(i) | Is there a Change to the Principles of Construction? 21.101(b)(1)(i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Change in the number or location of engines, e.g., four to two wing-mounted engines or two wing-mounted to two body-mounted engines. | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. |
| Change from a high wing to low wing configuration. | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. |
| Change from an all metal airplane to all composite primary structure (fuselage, wing, empennage). | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. |
| Change of empennage configuration for larger aeroplanes (cruciform vs. 'T' or 'V' tail) | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable regulations is required. |
| Increase from subsonic to supersonic flight regime | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable regulations is required. |

The following examples are for **SIGNIFICANT** changes for Large Aeroplanes (FAR/CS-25):

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)(i) | Is there a Change to the Principles of Construction? 21.101(b)(1)(i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
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| Reduction in the number of flight crew (In conjunction with flight deck update). | Yes | No | Yes | Extensive changes to avionics and aircraft systems. Impact to crew workload and human factors, pilot type rating. |
| Modify an aeroplane for flight in known icing conditions by adding systems for ice detection and elimination | Yes | No | Yes | New aircraft operating envelop. Requires major new systems installation and aircraft evaluation. Operating envelope changed. |
| Conversion-passenger or combi to all freighter including cargo door, redesign floor structure and 9g net or rigid barrier | Yes | No | Yes | Extensive airframe changes affecting load paths, aeroelastic characteristics, aircraft related systems for fire protection, etc. Design assumptions changed from passenger to freighter. |
| Increase in cabin Pressurization | No | No | Yes | Typically, a change greater than 10 % in operational cabin pressure differential. May require extensive airframe changes affecting load paths, fatigue evaluation, aeroelastic characteristics, etc. Invalidates design assumptions. |
| Addition of leading edge slats | Yes | No | No | Requires extensive changes to wing structure, adds aircraft level systems, and requires a new aeroplane flight manual to address performance and flight characteristics. |
| Fuselage stretch or shortening in the cabin or pressure vessel | Yes | No | Yes | Cabin interior changes are related changes since occupant safety considerations are impacted by a cabin length change. Even if a new cabin interior is not included in the product level change, the functional effect of the fuselage plug has implications on occupant safety (e.g., the dynamic environment in an emergency landing, emergency evacuation, etc.), and thus the cabin interior becomes an affected area. |
| Extensive structural airframe modification, such as installation of a large telescope with large opening in fuselage. | Yes | No | No | Requires extensive changes to fuselage structure, affects aircraft level systems, and requires a new aeroplane flight manual to address performance and flight characteristics. |
| Changing the number of axles or number of landing gear done in context with a product level change which involves changing the | Yes | No | No | Requires extensive changes to aircraft structure, affects aircraft l systems and requires AFM changes.. |

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| aeroplane gross weight. | | | | |
| Primary structure changes from metallic material to composite material. | No | Yes | No | Change in principles of construction and design from conventional practices. |
| Airframe life extension | No | No | Yes | This modification pertains to fuselage and/or wing limits, and ageing aeroplane concerns. An increase from the original life limit which constitutes a re-evaluation of certification design assumptions. |
| Typically, an increase in design weight of more than 10% | No | No | Yes | When it requires extensive re-substantiation of aircraft structure, aircraft performance and flying qualities and associated systems. |
| Installation of winglets. | Yes | No | Yes | |
| Wing changes in span, sweep, and tip designs or wing chord | Yes | No | Yes | When it requires extensive changes to wing structure, adds aircraft level systems, and requires a new AFM to address performance and flight characteristics. (NOTE: Potentially substantial if it is a change from a high wing to a low wing, or a new wing.) |
| Change in type or number of emergency exits in conjunction with an increase in the number of passengers demonstrated. | No | No | Yes | The new emergency egress requirements exceed those previously substantiated. |
| Comprehensive flight deck upgrade, such as conversion from entirely federated, independent electro-mechanical flight instruments to highly integrated and combined electronic display systems with extensive use of software and possibly complex hardware | No | No | Yes | Affects avionics and electrical systems integration and architecture concepts and philosophies. |
| Change in primary flight controls to fly by wire (FBW) system. (Some airplanes have some degree of FBW. Achieving full FBW may be a not significant change on some airplanes.) | No | No | Yes | When the degree of change is so extensive that it affects basic aircraft systems integration and architecture concepts and philosophies. This drives a complete re- assessment of flight crew workload, handling qualities, and performance evaluation, which are different from the original design assumptions. |
| Replace reciprocating with turbo-propeller engines | Yes | No | No | Requires extensive changes to airframe structure, adds aircraft level systems, and requires a new aeroplane flight manual to address performance and flight characteristics. |

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| Typically a thrust increase of more than 10% | No | No | Yes | When it requires extensive re-substantiation of powerplant installation, and has a marked effect on aircraft performance and flying qualities. |
| Initial installation of an autoland system | No | No | Yes | Baseline airplane noted signed for autoland operation, potential crew work load and systems compatibility issues |
| Installation of a new fuel tank(horizontal stabilizer tank or auxiliary fuel tank in the fuselage outside the wing in conjunction with increased maximum takeoff weight and takeoff thrust) | No | No | Yes | Requires changes to airframe, systems and AFM. Results in performance changes. |
| Main deck cargo door installation. | Yes | No | No | Redistribution of internal loads, change in aeroelastic characteristics, system changes. |
| Expansion of an aircraft's operating envelope | No | No | Yes | An expansion of operating capability would normally be a significant change (e.g. an increase in maximum altitude limitation, approval for flight in known icing conditions, or an increase in airspeed limitations). Merely operating a product to an expanded envelope for which it was originally designed is generally not a significant change. In this case, the assumptions used for certification of the basic product remain valid and the results can be applied to cover the changed product with predictable effects or can be demonstrated without significant physical changes to the product. |
| Conversion from a passenger floor to a cargo floor and installation of a cargo handling system. | No | No | Yes | Completely new floor loading and design. Redistribution of internal loads, change in cabin safety requirements, system changes. |
| Initial installation of an APU essential for aircraft flight operation. | No | No | Yes | Changes emergency electrical power requirements, change in flight manual and operating characteristics. |
| Conversion from hydraulically actuated brakes to electrically actuated brakes | No | No | Yes | Assumptions of certification for aeroplane performance are changed. |
| Change to aeroplane's cabin operating altitude, or operating pressure | No | No | Yes | An increase greater than 10 % in maximum cabin pressure differential invalidates certification assumptions and the fundamental approach used in decompression. structural strength, and fatigue analysis. |
| Installation of engine thrust reversers | Yes | No | Yes | |

The following examples are for **NOT SIGNIFICANT** changes for Large Aeroplanes (FAR/CS-25):

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)( i) | Is there a Change to the Principles of Construction? 21.101(b)(1)( i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Alternate engine installation or hush kit at same position | No | No | No | Although an aeroplane level change, it is not significant so long as there is not more than a 10% increase in thrust or a change in the principles of propulsion. |
| A small change in fuselage length due to re-fairing the aft body or radome | No | No | No | For cruise performance reasons, where such changes do not require extensive structural, systems, aerodynamic or AFM changes. |
| Re-fairing of wing tip caps (e.g., for lights, fuel dump pipes) and addition of splitter plates to the trailing edge thickness of the cruise airfoil. | No | No | No | Does not require extensive structural, AFM, or systems changes. |
| Additional power used to enhance high altitude or hot day performance | No | No | No | Usually no change in basic operating envelope. Existing cert data can be extrapolated. Could be significant product change if the additional power is provided by installation of a rocket motor or additional, on demand engine due to changes in certification assumptions. |
| Initial installation of an autopilot system | No | No | See Note | It may be possible that the modification is adaptive in nature, with no change to original certification assumptions. However, in certain cases the installation of an auto-pilot may include extensive changes and design features which change the assumptions for certification (i.e. installation of the auto-pilot may introduce a number of additional mechanical and electronic failure modes and change the hazard classification of given aircraft level failures). |
| Change from assembled | No | No | No | Method of construction must |

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| primary structure to monolithic or integrally machined structure | | | | be well understood. |
| Modification to ice protection systems | No | No | No | Re-certification required, but type-certification basis is adequate. |
| Brakes: design or material change, e.g., steel to carbon | No | No | No | Re-certification required, but type-certification basis is adequate. |
| Redesign floor structure | No | No | No | By itself, this is not a significant product level change. It could be a significant change if part of a cargo converted passenger airplane. |
| New cabin interior with no fuselage length change | No | No | No | A new cabin interior includes new ceiling and sidewall panels, stowage, galleys, lavatories, and seats. New and novel features in the cabin interior may require special conditions.<br>Many interior related requirements are incorporated in operational rules. Even though the design approval holder may not be required to comply with these requirements, the operator may be required to comply. |
| A re-arrangement of an interior (e.g. seats, galleys, lavatories, closets, etc.) | No | No | No | Re-arrangement requires the use of the existing floor mounting structure. |
| Novel or unusual method of construction of a component. | No | No | No | Special conditions could be required if there are no existing requirements that adequately address these features. The component change does not rise to the product level change |
| Initial installation of a non-essential APU | No | No | No | A stand-alone initial APU installation on an airplane originally designed to use ground/airport supplied electricity, and air-conditioning. In this case, the APU would be an option to be independent of airport power. |

## Table 3. Examples of changes for Rotorcraft (FAR/CS-27 and-29):

The following examples are for **SUBSTANTIAL** changes for Rotorcraft (FAR/CS-27 and FAR/CS-29):

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)( i) | Is there a Change to the Principles of Construction? 21.101(b)(1)( i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Change from the number and or configuration of rotors (e.g., main & tail rotor system to two main rotors. | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. |
| Change from an all-metal rotorcraft to all composite rotorcraft. | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable requirements is required. |

The following examples are for **SIGNIFICANT** changes for Rotorcraft (FAR/CS-27 and FAR/CS-29):

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)( i) | Is there a Change to the Principles of Construction? 21.101(b)(1)( i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Comprehensive flight deck upgrade, such as conversion from entirely federated, independent electro-mechanical flight instruments to highly integrated and combined electronic display systems with extensive use of software and/or complex electronic hardware | No | No | Yes | Affects avionics and electrical systems integration and architecture concepts and philosophies. |
| Certification for flight into known icing conditions. | No | No | Yes | |
| (Fixed) flying controls from mechanical to fly by wire | No | No | Yes | This drives a complete re-assessment of the rotorcraft controllability and flight control failure. |
| Addition of an engine; e.g., from single to twin or reduction of the number of engines; e.g., from twin to single | Yes | Yes | Yes | May be Substantial depend upon project details |

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| A change of rotor drive system primary gearbox splash type lubrication system to a pressure lubricated system due to an increase in horsepower of an engine or changing a piston engine to a turbine engine | No | Yes | Yes | |
| A fuselage or tail boom modification that changes the primary structure, aerodynamics, and operating envelope sufficiently to invalidate the certification assumptions | Yes | No | Yes | |
| Application of an approved primary structure to a different approved model (e.g., installation on a former model of the main rotor approved on a new model that results in increase performance | No | Yes | Yes | |
| Extensive Primary structure changes from metallic material to composite material. | No | Yes | Yes | Change in principles of construction and assumptions used for certification for the product level change.<br>Changes of a few individual elements from metal to composite are not typically considered a significant change . |
| Emergency Medical Service (EMS) configuration with primary structural changes sufficiently to invalidate the certification assumptions | No | No | Yes | Many EMS configurations will not be classified as significant. Modifications made for EMS are typically internal, and the general external configuration is normally not affected. These changes should not automatically be classified as significant. |
| Skid landing gear to wheel landing gear or wheel landing to skid | Yes | No | Yes | |
| Change of the number of rotor blades | Yes | No | No | |
| Change tail anti-torque device (e.g., tail rotor, ducted fan or other technology) | Yes | Yes | No | |
| Passenger configured helicopter to a fire fighting equipment configured helicopter | Yes | No | Yes | Depends on the fire fighting configuration. |
| Passenger configured helicopter to an agricultural configured helicopter | Yes | No | Yes | Depends on the agricultural configuration. |
| A new Category A certification approval to an existing configuration | No | No | Yes | |

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| Instrument Flight Rules (IFR) upgrades involving installation of upgraded components for new IFR configuration | No | No | Yes | |
| Human External Cargo (HEC) certification approval | No | No | Yes | Must comply with the latest HEC airworthiness codes in order to obtain operational approval. HEC include fatigue, Quick Release Systems, High Intensity Radio Frequency (HIRF), One Engine Inoperative (OEI) performance and OEI procedures. |
| Reducing the number of pilots for IFR from 2 to 1 | No | No | Yes | |

The following examples are for **NOT SIGNIFICANT** changes for Rotorcraft (FAR/CS-27 and -29):

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)( i) | Is there a Change to the Principles of Construction? 21.101(b)(1)( i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Emergency floats | No | No | No | Must Comply to the specific applicable requirements for emergency floats. This installation, in itself, does not change the rotorcraft configuration, overall performance, or operational capability. Expanding an operating envelope (such as operating altitude and temperature) and mission profile (such as passenger carrying operations to external load operations, or flight over water, or operations in snow conditions) are not by themselves so different that the original certification assumptions are no longer valid at the type-certificated product level. |
| FLIR or surveillance camera installation | No | No | No | Additional flight or structural evaluation may be necessary but the change does not alter the basic rotorcraft certification |
| Helicopter Terrain Awareness Warning System (HTAWS) for operational credit | No | No | No | Certified per rotorcraft HTAWS AC guidance material and ETSO-C194. |
| Health Usage Monitoring System (HUMS) for Maintenance Credit | No | No | No | Certified per rotorcraft HUMS AC guidance material |

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| Expanded limitations with minimal or no design changes, following further tests/justifications or different mix of limitations (CG limits, oil temperatures, altitude, minimum/maximum weight, minimum/max external temperatures, speed, ratings structure) | No | No | No | Expanding an operating envelope (such as operating altitude and temperature) and mission profile (such as passenger carrying operations to external load operations, or flight over water, or operations in snow conditions) are not by themselves so different that the original certification assumptions are no longer valid at the type-certificated product level. |
| Installation of a new engine type, equivalent to the former one; leaving a/c installation and limitations substantially unchanged | No | No | No | Refer to AC 27-1 or AC 29-2 for guidance |
| Windscreen installation | No | No | No | Does not change the rotorcraft overall product configuration |
| Snow skis, "Bear Paws" | No | No | No | Must comply with specific requirements associated with the change. Expanding an operating envelope (such as operating altitude and temperature) and mission profile (such as passenger carrying operations to external load operations, or flight over water, or operations in snow conditions) are not by themselves so different that the original certification assumptions are no longer valid at the type-certificated product level. |
| External Cargo Hoist | No | No | No | Must Comply to the specific applicable requirements for external loads. This installation, in itself, does not change the rotorcraft configuration, overall performance, or operational capability. Expanding an operating envelope (such as operating altitude and temperature) and mission profile (such as passenger carrying operations to external load operations, or flight over water, or operations in snow conditions) are not by themselves so different that the original certification assumptions are no longer valid at the type-certificated product level. |
| Instrument Flight Rules (IFR) upgrades involving installation of upgraded components to replace existing components. | No | No | No | Not a rotorcraft level change. |

## Table 4. Examples for Engines (FAR-33/CS-E)

The following are examples of **SUBSTANTIAL** changes for Engines (FAR 33/CS-E):

**Turbine engines**

| Description of change | Is there a Change to the General Configuration? 21.101(b) (1)(i) | Is there a Change to the Principles of Construction? 21.101(b) (1)(i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Traditional turbofan to geared-fan engine | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable regulations is required.<br>Note: There may be certain circumstances where this change would be significant. |
| Low bypass ratio engine to high bypass ratio engine with an increased inlet area. | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable regulations is required.<br>Note: There may be certain circumstances where this change would be significant. |
| Turbojet to Turbofan | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable regulations is required.<br>Note: There may be certain circumstances where this change would be significant. |
| Turbo-shaft to turbo-propeller | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable regulations is required.<br>Note: There may be certain circumstances where this change would be significant. |
| Conventional ducted fan to unducted fan | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable regulations is required.<br>Note: There may be certain circumstances where this change would be significant. |
| Conventional engine for subsonic operation to after-burning engine for supersonic operation | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable regulations is required. |

The following are examples of **SIGNIFICANT** changes for Engines (FAR 33/CS-E):

**Turbine engines**

| Description of change | Is there a Change to the General Configuration? 21.101(b) (1)(i) | Is there a Change to the Principles of Construction? 21.101(b) (1)(i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Increase/decrease in the number of compressor/turbine stages with resultant change in approved limitations*. (* excludes life limits) | Yes | No | Yes | Change is associated with other changes to the ratings and operating limitations; engine dynamic behaviour in terms of backbone bending, torque spike effects on casing, surge and stall characteristics, etc. |
| New design fan blade and fan hub, or a bladed fan disk to a blisk or a fan diameter change that could not be retrofitted | Yes | No | Yes | Change is associated with other changes to the engine thrust, ratings and operating limitations; engine dynamic behaviour in terms of backbone bending, torque spike effects on casing, foreign object ingestion behaviour, burst model protection for the aircraft. If there is a diameter change, installation will be also affected. |
| Hydro-Mechanical control to FADEC/EEC without hydro-mechanical backup | Yes | No | No | Change in engine control configuration. Not interchangeable. Likely fundamental change to engine operation. |
| A change in the containment case from hard-wall to composite or vice-versa, that could not be retrofitted without additional major changes to the engine or restrictions in the initial limitations in the installation manual | No | Yes | No | Change in methods of construction that have affected inherent strength, backbone bending, blade to case clearance retention, containment wave effect on installation, effect on burst model, torque spike effects. |
| Replacement of the gas generator (core) with a different one that is associated with changes in approved limitations* (* excludes life limits) | No | No | Yes | Change is associated with other changes that would affect performance envelope and may affect the dynamic behaviour of the engine Assumptions used for certification may no longer be valid |

**Piston engines**

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)(i) | Is there a Change to the Principles of Construction? 21.101(b)(1)(i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Convert from Mechanical to Electronic Control System | Yes | Yes | No | Change in engine control configuration. : Installation interface of engine changed Changes to principles of construction: Digital controllers and sensors require new construction techniques and environmental testing. |
| Add Turbocharger that increases performance and changes in overall product | Yes | No | Yes | Change in general configuration: Installation interface of engine changed (exhaust system) Certification assumptions invalidated. Change in engine configuration Change in operating envelope and performance |
| Convert from air-cooled cylinders to liquid cooled cylinders. | Yes | No | Yes | Change in general configuration: Installation interface of engine changed (cooling lines from radiator, change to cooling baffles) Certification assumptions invalidated. Change in operating envelope and engine temperature requirements. |
| Convert from spark-ignition to compression-ignition | Yes | No | Yes | Change in general configuration: Installation interface of engine changed (no mixture lever) Certification assumptions invalidated: Change in operating envelope and performance. |

The following are examples of **NOT SIGNIFICANT** changes for Engines (FAR 33/CS-E):

**Turbine engines**

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)(i) | Is there a Change to the Principles of Construction? 21.101(b)(1)(i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Change in the material from one type of metal to another type of metal of a compressor drum | No | No | No | No change in performance. Assumptions are still valid. |
| Increase/decrease in the number of compressor/turbine stages without resultant change in | No | No | No | No change in performance. Assumptions are still valid. |

| | | | | |
|---|---|---|---|---|
| performance envelope | | | | |
| New components internal to the FADEC/EEC the introduction of which does not change the function of the system | No | No | No | No change in configuration. Retrofitable. Assumptions used for certification are still valid. Possible changes in principles of construction are insignificant |
| Software changes | No | No | No | |
| Rub-strip design changes | No | No | No | |
| A new combustor that does not change the approved limitations*, or dynamic behaviour (* excludes life limits) | No | No | No | |
| Bearing changes | No | No | No | |
| New blade designs with similar material that can be retrofitted | No | No | No | |
| Fan blade re-design that can be retrofitted | No | No | No | |
| Oil tank re-design | No | No | No | |
| Change from one hydro-mechanical control to another hydro-mechanical control | No | No | No | |
| Change to limits on life limited components | No | No | No | |
| Changes to limits on exhaust gas temperature | No | No | No | |
| Changes in certification maintenance requirements (CMR) with no configuration changes | No | No | No | |
| Bump ratings within the product's physical capabilities that may be enhanced with gas path changes that are limited to such changes as blade re-stagger, cooling hole patterns, blade coating changes, etc. | No | No | No | |
| A change in principal physical properties and mechanics of load transfer of a material of primary structure or highly loaded components. For example, change from traditional metal to either an exotic alloy or a composite material on a highly loaded component | No | No | No | Component Level Change |

**Piston engines**

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)(i) | Is there a Change to the Principles of Construction? 21.101(b)(1)(i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| A change in principal physical properties and mechanics of load transfer of a material of primary structure or highly loaded components. For example, change from traditional metal to either an exotic alloy or a composite material on a highly loaded component | No | No | No | |
| New or redesigned cylinder head, or valves or pistons. | No | No | No | |
| Changes in crankshaft | No | No | No | |
| Changes in crankcase | No | No | No | |
| Changes in carburettor | No | No | No | |
| Changes in mechanical fuel injection system | No | No | No | |
| Changes in mechanical fuel injection pump | No | No | No | |
| Engine model change to accommodate new airplane installation. No change in principles of operation of major subsystems; no significant expansion in power or operating envelopes or in limitations | No | No | No | |
| No change in basic principles of operation, or a simple mechanical change. For example, change from dual magneto to two single magnetos on a model | No | No | No | |
| Subsystem change produces no change in base input parameters, and previous analysis can be reliably extended. For example, a change in turbocharger where induction system inlet conditions remain unchanged, or if changed, the effects can be reliably extrapolated | No | No | No | |
| Change in material of secondary structure or not highly loaded component. For example, a change from metal to composite material in a non-highly loaded component, such as an oil pan that is not used as a mount pad | No | No | No | |
| Change in material that retains the physical properties and mechanics of load transfer. For example, a change in trace elements in a metal casting for ease of pouring or to update to a newer or more readily available alloy with similar mechanical properties | No | No | No | |

## Table 5. Examples of Changes for Propellers (FAR-35/CS-P)

The following are examples of **SUBSTANTIAL** changes for Propellers (FAR 35/CS-P):

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)(i) | Is there a Change to the Principles of Construction? 21.101(b)(1)(i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Change in the number of blades | N/A | N/A | N/A | Proposed change in design is so extensive that a substantially complete investigation of compliance with the applicable regulations is required. |

The following are examples of **SIGNIFICANT** changes for Propellers (FAR 35/CS-P):

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)(i) | Is there a Change to the Principles of Construction? 21.101(b)(1)(i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Principle of pitch change such as a change from single acting to dual acting | Yes | Yes | Yes | Requires extensive modification of the pitch change system with the introduction of back-up systems. The inherent control system requires re-evaluation. |
| Introduction of a different principle of blade retention such as a single row to a dual row bearing | Yes | Yes | No | Requires extensive modification of the propeller hub and blade structure. The inherent strength requires re-evaluation. |
| A hub configuration change such as a split hub to a one-piece hub | Yes | Yes | No | Requires extensive modification of the propeller hub structure. The inherent strength requires re-evaluation. |
| Changing the method of mounting the propeller to the engine such as a spline to a flange mount | Yes | Yes | No | Requires extensive modification of the propeller hub structure. Note: Such a change could be considered not significant if implemented without a change in general configuration or principals of construction. |
| Change in hub material from steel to aluminium | Yes | Yes | No | Requires extensive modification of the propeller hub structure and change to method of blade retention. The inherent strength requires re-evaluation. |
| Change in blade material from metal to composite | Yes | Yes | Yes | Requires extensive modification of the propeller blade structure and change to method of blade retention. Composite construction |

| | | | | |
|---|---|---|---|---|
| | | | | methods required.<br>The inherent strength requires re-evaluation. |
| Change from hydro-mechanical to electronic control | Yes | Yes | Yes | Electronic manufacturing and design methods required.<br>Assumptions used for certification are no longer valid or were not addressed in the original certification, i.e., high intensity radio frequency (HIRF) and lightning protection, fault tolerance, software certification and other aspects.<br>The propeller will require special conditions under 21.16B |

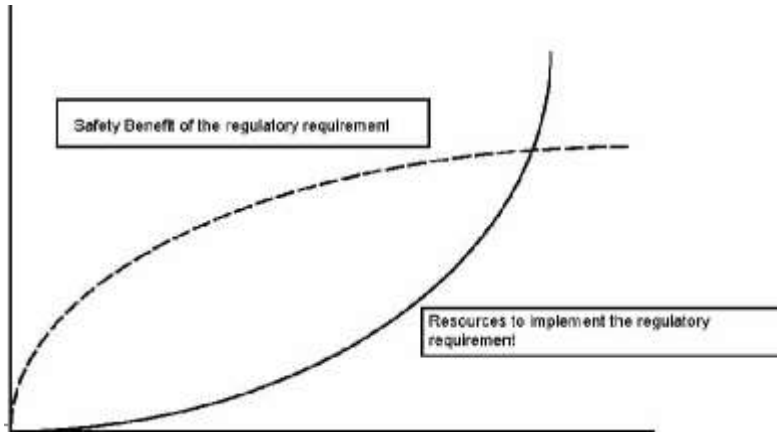
The following are examples of **NON-SIGNIFICANT** changes for Propellers (FAR 35/CS-P):

| Description of change | Is there a Change to the General Configuration? 21.101(b)(1)(i) | Is there a Change to the Principles of Construction? 21.101(b)(1)(i) | Have the assumptions used for Certification been invalidated? 21.101(b)(1)(ii) | Notes |
|---|---|---|---|---|
| Change in the material of a blade bearing | No | No | No | |
| Change to a component in the control system | No | No | No | |
| Change to a de-icer boot | | | | |
| Changes to the operational design envelope such as an increase in power. | No | No | No | Propeller's operating characteristics and inherent strength require re-evaluation. |
| Change to the intended usage such as normal to aerobatic category. | No | No | No | Propeller's operating characteristics and inherent strength require re-evaluation. |

**Appendix B to GM 21.101 Procedure for evaluating impracticality of applying latest airworthiness codes to a changed product**

1. Introduction
   a. The basic principle of enhancing the level of safety of changed aeronautical products is to apply the latest airworthiness codes for significant design changes to the greatest extent practical. In certain cases, the cost of complying fully with a later airworthiness codes may not be commensurate with the small safety benefit achieved. It is recognised that the existing fleet and newly produced aeroplanes, engines and propellers are safe, and any unsafe condition is immediately addressed through the airworthiness directive process. These factors form the basis where compliance with the latest airworthiness codes may be considered impractical, thereby allowing compliance with an earlier airworthiness codes. This appendix gives one method of determining if compliance with a later requirement standard is impractical; however, this does not preclude the use of other methods for improving the safety of aeronautical products.
   b. This GM recognises that other procedures can be used and have historically been accepted on a case-by-case basis. The acceptance of results through the use of these procedures may vary from state to state. Consequently, they may not be accepted through all bilateral certification processes. Regardless of which method is used, the process should show that a proposed type-certification basis is able to achieve a positive safety benefit for the overall product.
   c. In this regard, any method used should encourage incorporating safety enhancements that will have the most dramatic impact on the level of safety of the aircraft while considering effective use of resources. This important point is illustrated graphically in the accompanying figure. This figure notionally shows the interrelation between the total resources required for incorporating each potential safety enhancement with the corresponding net increase in safety benefit.

**Figure 2. Safety Benefits vs. Resources**




   d. Typically, one will find that there are proposals that can achieve a positive safety benefit and that are resource effective. Conversely, there are proposals that may achieve a small safety benefit at the expense of a large amount of resources to

implement. Clearly, there will be a point where a large percentage of the potential safety benefit can be achieved with a reasonable expenditure of resources. The focus of the methods used should be to determine the most appropriate standards relative to the respective cost to reach this point.

e. This Appendix to GM 21.101 provides procedural guidance for determining the practicality of applying a airworthiness codes at a particular amendment level to a changed product. This guidance can be used to evaluate the safety benefit and resource impact of implementing the latest airworthiness codes in the type-certification basis of a changed product. The procedure is generic in nature and describes the steps and necessary inputs that any applicant can use on any project to develop a position.

f. The procedure is intended to be used, along with good engineering judgment, to evaluate the relative merits of a changed product complying with the latest airworthiness codes. It provides a means, but not the only means, for an applicant to present its position in regard to impracticality.

g. The type-certification basis for a change to a product will not be at an amendment level earlier than the existing type-certification basis. Therefore, when determining the impracticality of applying a airworthiness codes at the latest amendment level, only the increase in safety benefits and costs beyond compliance with the existing type-certification basis should be considered.

2. Procedure for evaluating Impracticality of applying latest airworthiness codes to a changed product

The following are steps to determine the impracticality of applying a airworthiness codes at a particular amendment level. The first step will be to identify the regulatory change being evaluated.

a. Step 1: Identify the regulatory change being evaluated.

In this step, it will be necessary to document:

(1) The specific airworthiness codes (for example, CS 25.365);

(2) The amendment level of the existing type-certification basis for the airworthiness codes; and

(3) The latest amendment level of the airworthiness codes.

b. Step 2: Identify the specific hazard that the Requirement addresses

(1) Each airworthiness codes and subsequent amendments are intended to address a hazard or hazards. In this step the specific hazard(s) is/are identified. This identification will allow for a comparison of the effectiveness of amendment levels of the airworthiness codes at addressing the hazard.

(2) In many cases the hazard and the cause of the hazard will be obvious. When the hazard and its related cause are not immediately obvious, it may be necessary to review the available background information from development and adoption of this airworthiness codes (Explanatory Note and Comment/Response Document to the NPA. It may also be helpful to discuss the hazard with the DGCA).

c. Step 3: Review the consequences of the hazard(s)

(1) Once the hazard has been identified, it is possible to identify the types of consequences that may occur because of the presence of the hazard. More than one consequence can be attributed for the same hazard. Typical examples of consequences would include, but are not be limited to:

- Incidents where only injuries occurred;
- Accidents where less than 10 % of the passengers died;
- Accidents where 10 % or more passengers died; and
- Accidents where a total hull loss occurred.

(2) The background information from development and adoption of the airworthiness codes may provide useful information regarding the consequences of the hazard the requirement is intended to address.

d. Step 4: Identify the historical and predicted frequency of each consequence

(1) Another source for determining impracticality is the historical record of the consequences of the hazard that led to a requirement or an amendment to a requirement. From these data, a frequency of hazard occurrence can be determined. It is important to recognise that the frequency of occurrence may be higher or lower in the future. Therefore, it is also necessary to predict the frequency of future occurrences.

(2) More than one consequence can be attributed for the same hazard. Therefore, when applicable, the combination of consequences and frequencies of those consequences should be considered together.

(3) The background information from development and adoption of the airworthiness codes may provide useful information regarding the frequency of occurrence.

e. Step 5: Determine how effective full compliance with the latest amendment of the **Requirement** would be at addressing the hazard

(1) When each amendment is promulgated, it is usually expected that compliance with the airworthiness codes would be completely effective at addressing the associated hazard. It is expected that the hazard would be eliminated, avoided, or dealt with. However, in a limited number of situations, this may not be the case. It is also possible that earlier amendment levels may have addressed the hazard but were not completely effective. Therefore, in comparing the benefits of compliance with the existing type-certification basis to the latest amendment level, it is useful to estimate the effectiveness of both amendment levels in dealing with the hazard.

(2) It is recognised that the determination of levels of effectiveness is normally of a subjective nature. These are relative assessments of a qualitative nature that should not be treated as absolute determinations. Therefore, prudence should be exercised when making these determinations. In all cases, it is necessary to document the assumptions and data that support the determination.

(3) The following five levels of effectiveness are provided as a guideline:

(a) Fully effective in all cases.

Compliance with the requirement eliminates the hazard or provides a means to avoid the hazard completely.

(b) Considerable potential for eliminating or avoiding the hazard.

Compliance with the requirement eliminates the hazard or provides a means to avoid completely the hazard for all probable or likely cases, but it does not cover all situations or scenarios.

(c) Adequately deals with the hazard.

Compliance with the requirement eliminates the hazard or provides a means to avoid the hazard completely in many cases. However, the hazard is not eliminated or avoided in all probable or likely cases. Usually this action only addresses a significant part of a larger or broader hazard.

(d) Hazard only partly addressed.

In some cases compliance with the requirement partly eliminates the hazard or does not completely avoid the hazard. The hazard is not eliminated or avoided in all probable or likely cases. Usually this action only addresses part of a hazard.

(e) Hazard only partly addressed but action has negative side effect.

Compliance with the requirement does not eliminate or avoid the hazard or may have negative safety side effects. The action is of questionable benefit.

f. Step 6: Determine resource costs and cost avoidance

(1) There is always cost associated with complying with a requirement. This cost may range from minimal administrative efforts to the resource expenditures that support full scale testing or the redesign of a large portion of an aircraft. However, there are also potential cost savings from compliance with a requirement. . For example, compliance with a requirement may avoid aircraft damage or accidents and the associated costs to the manufacturer for investigating accidents. Compliance with the latest amendment of a airworthiness codes may also facilitate certification of a product by the competent authority of a third country.

(2) When determining the impracticality of applying a airworthiness codes at the latest amendment level, only the incremental costs and safety benefits from complying with the existing type-certification basis should be considered.

(3) When evaluating the incremental cost, it may be beneficial for the applicant to compare the increase in cost to comply with the latest airworthiness codes to the cost to incorporate the same design feature in a new aeroplane. In many cases an estimate for the cost of incorporation in a new aeroplane is provided in the regulatory evaluation Regulatory Impact Assessment (RIA) by the DGCA, which was presented when the corresponding airworthiness codes was first promulgated. Incremental costs of retrofit/incorporation on existing designs may be higher than that for production. Examples of costs may include but are not limited to:

(a) Costs: The accuracies of fleet size projections, utilisation, etc. may be different than that experienced for derivative product designs and must be validated.

- Labour: Work carried out in the design, fabrication, inspection, operation or maintenance of a product for the purpose of incorporating or demonstrating compliance with a proposed action. Non-recurring labour requirements, including training, should be considered.
- Capital: Construction of new, modified or temporary facilities for design, production, tooling, training, or maintenance.
- Material: Cost associated with product materials, product components, inventory, kits, and spares.
- Operating Costs: Costs associated with fuel, oil, fees, and expendables.
- Revenue/Utility Loss: Costs resulting from earning/usage capability reductions from departure delays, product downtime, capability reductions of performance loss due to seats, cargo, range, or airport restrictions.

(b) Cost Avoidance:

- Avoiding cost of accidents, including investigation of accidents, lawsuits, public relations activities, insurance, and lost revenue.
- Foreign Certification: Achieve a singular effort that would demonstrate compliance to the requirements airworthiness standards of most certifying agencies, thus minimising certification costs.

g. Step 7: Document conclusion. Once the information from previous steps has been documented and reviewed, the applicant's position and rationale regarding practicality can be documented. Examples of possible positions would include, but are not limited to:

(1) Compliance with the latest airworthiness codes is necessary. The applicant would pursue the change at the latest amendment level.

(2) Compliance with an amendment level between the existing type-certification basis and the latest amendment would adequately address the hazard at an acceptable cost, while meeting the latest amendment level would be impractical. The applicant would then propose the intermediate amendment level of the airworthiness codes.

(3) The increased level of safety is not commensurate with the increased costs associated with meeting the latest amendment instead of the

existing type-certification basis. Therefore, the applicant would propose the existing type-certification basis.

(4) The results of this analysis were inconclusive. Further discussions with the DGCA are warranted.

Note: This process may result in a required type-certification basis that renders the proposed modification economically not viable.

3. Examples of how to certify changed aircraft. The following examples are for large aeroplanes and illustrate the typical process an applicant follows. The process will be the same for all product types.

a. Example 1: CS 25.963 (e) Fuel tank access covers

(1) This change is part of a significant large aeroplane change that increases passenger payload and gross weight by extending the fuselage by 20 feet. To accommodate the higher design weights and increased braking certification specification, and to reduce runway loading, the applicant will change the landing gear from a two-wheel to four-wheel configuration; this changes the debris scatter on the wing from the landing gear. The new model aeroplane will be required to comply with the latest applicable certification specification based on the date of application.

(2) The wing will be strengthened locally at the side of the body and at the attachment of engines and landing gear, but the applicant would not like to alter wing access panels and the fuel tank access covers. Although the applicant recognises that the scatter pattern and impact loading on the wing from debris being thrown from the landing gear will change, he proposes that it would be impractical to redesign the fuel tank access covers.

(3) Step 1: Identify the regulatory change being evaluated

(a) The existing certification basis of the aeroplane that is being changed is CS-25 prior to Amendment 3.

(b) Amendment 3 to CS-25 added the requirement certification specification that fuel tank access covers on large aeroplanes be designed to minimise penetration by likely foreign objects, and be fire resistant.

(4) Step 2: Identify the specific hazard that the **Regulation** certification specification addresses

Fuel tank access covers have failed in service due to impact with high-energy objects such as failed tire tread material and engine debris following engine failures. In one accident, debris from the runway impacted a fuel tank access cover, causing its failure and subsequent fire, which resulted in fatalities and loss of the aeroplane. Amendment 3 ensures that all access covers on all fuel tanks are designed or located to minimise penetration by likely foreign objects, and are fire resistant.

(5) Step 3: Review the history of the consequences of the hazard(s)

Occurrences with injuries and with more than 10 % deaths.

(6) Step 4: Identify the historical and predicted frequency of each consequence

(a) In 200 million departures of large jets:

- One occurrence with more than 10 % deaths; and
- One occurrence with injuries.

(b) There is no reason to believe that the future rate of accidents will be significantly different than the historical record.

(7) Step 5: Determine how effective full compliance with the latest amendment of the **Regulation** certification specification would be at addressing the hazard

(a) Considerable potential for eliminating or avoiding the hazard.

(b) Compliance with Amendment 3 eliminates the hazard or provides a means to avoid the hazard completely for all probable or likely cases. However, it does not cover all situations or scenarios.

(8) Step 6: Determine resource costs and cost avoidance

(a) Costs:

- For a newly developed aeroplane, there would be minor increases in labour resulting from design and fabrication.
- There would be a negligible increase in costs related to materials, operating costs, and revenue utility loss.

(b) Cost avoidance:

- There were two accidents in 200 million departures. The applicant believes that it will manufacture more than 2 000 of these aeroplanes or derivatives of these aeroplanes. These aeroplanes would average five flights a day. Therefore, statistically there will be accidents in the future if the hazard is not alleviated. Compliance will provide cost benefits related to avoiding lawsuits, accident investigations, and public relation costs.
- There are cost savings associated with meeting a single type-certification basis for the DGCA and foreign regulations.

(9) Conclusion

It is concluded that compliance with the latest certification specification increases the level of safety at a minimal cost to the applicant. Based on the arguments and information presented by the applicant through the Certification Review Item (CRI) process, the DGCA determined that meeting the latest amendment would be practical.

b. Example 2: 14 CFR § 25.365 pressurised compartment loads

Note: This example is taken from the FAA certification experience gained, so references to FAR sections and amendments are kept.

(1) This example is a passenger to freighter conversion STC.

(2) This change affects the floor loads on the airplane as well as the decompression venting.

(3) Step 1: Identify the regulatory change being evaluated

(a) The existing certification basis of the airplane that is being changed includes 14 CFR § 25.365 at Amendment 25-40 25-0. The initial release of 14 CFR § 25.365 required that the interior structure of passenger compartments be designed to withstand the effects of a sudden release of pressure through an opening resulting from the failure or penetration of an external door, window, or windshield panel, or from structural fatigue or penetration of the fuselage, unless shown to be extremely remote.

(b) Amendment 25-54 revised 14 CFR § 25.365 to require that the interior structure be designed for an opening resulting from penetration by a portion of an engine, an opening in any compartment of a size defined by 14 CFR § 25.365(e)(2), or the maximum opening caused by a failure not shown to be extremely improbable. The most significant change is the 'formula hole size' requirement introduced into § 25.365(e)(2) at Amendment 25-54.

(c) Amendment 25-71/72 (Amendments 25-71 and 25-72 are identical) extended the requirement to all pressurised compartments, not just passenger compartments, and to the pressurisation of unpressurised areas. Pressurisation of unpressurised areas had previously been identified as an unsafe feature under 14 CFR § 21.21(b)(2).

(d) Amendment 25-87 redefined the pressure differential load factor that applies above an altitude of 45 000 feet. Compliance with Amendment 25-87 is not affected since the airplane does not operate above an altitude of 45 000 feet. The applicant proposes to meet the 'pressurisation into unpressurised areas' requirement introduced in Amendment 25-71/72. The applicant does not propose to comply with the formula hole size requirement introduced in § 25.365(e)(2) at Amendment 25-54.

(4) Step 2: Identify the specific hazard that the regulation addresses

The hazard is a catastrophic structure and/or system failure produced by a sudden release of pressure through an opening in any compartment in flight. This opening could be caused by an uncontained engine failure, an opening of a prescribed size due to the inadvertent opening of an external door in flight, or an opening caused by a failure not shown to be extremely improbable. The opening could be produced by an event that has yet to be identified.

(5) Step 3: Review the history of the consequences of the hazard(s)

Occurrences with injuries, less than 10 % deaths, and more than 10 % deaths.

(6) Step 4: Identify the historical and predicted frequency of each consequence

(a) In 200 million departures of large jets:

- Two occurrences with more than 10 % deaths;
- One occurrence with less than 10 % deaths; and
- One occurrence with injuries.

(b) There is no reason to believe that the future rate of accidents will be significantly different than the historical record.

(7) Step 5: Determine how effective full compliance with the latest amendment of the regulation would be at addressing the hazard

(a) Compliance with the latest amendment eliminates the hazard or provides a means to avoid the hazard completely.

(b) Design changes made to the proposed derivative airplane bring it closer to full compliance with 14 CFR § 25.365 at Amendment 25-54. The original airplane was shown to meet the requirements for a hole size of 1.1 square feet. Amendment 25-54 would require a hole size of 5.74 square feet, and the current reinforcements for the converted airplane can sustain a hole size of 3.65 square feet in the forward area and 2.65 at the aft area. This is 3.1 and 2.4 times respectively better than the original design condition of Amendment 25-0 and is a significant improvement over the worldwide passenger fleet in service.

(8) Step 6: Determine resource costs and cost avoidance

(a) Costs: There would be savings in both labour and capital costs if compliance were shown demonstrated to Amendment 25-0 instead of Amendment 25-54. Major modifications to the floor beams would be necessary to meet the formula hole size requirement in Amendment 25-54.

(b) Cost Avoidance:

(1) There were four accidents in 200 million departures. The applicant believes that it will manufacture more than 2 000 of these airplanes or derivatives of these airplanes. These airplanes would average two flights a day. Therefore, statistically there will be accidents in the future if the hazard is not alleviated. Compliance will provide cost benefits related to avoiding lawsuits, accident investigations, and public relation costs.

(2) There are cost savings associated with meeting a single certification basis for FAA and foreign regulations.

(9) Step 7: Document conclusion regarding practicality.

The design complies with 14 CFR § 25.365 at Amendment 25-0, 25-71/72, and 25-87, and is nearly in full compliance with Amendment 25-54 (and certain aspects of Amendments 25-71/72 and 25-87). The design would adequately address the hazard at an acceptable cost. Therefore, based on arguments of impracticality discussed in an issue paper, the FAA accepts the applicant's proposal to comply with 14 CFR § 25.365 at Amendment 25-0.

**Appendix C to GM 21.101 The use of service experience in the certification process**

1. Introduction

Service experience may be utilised to support the application of an earlier airworthiness codes if, in conjunction with the applicable service experience and other compliance measures, the earlier standard provides airworthiness codes provide a level of safety comparable to that provided by the latest airworthiness codes. It is incumbent on the applicant to provide sufficient substantiation to allow the DGCA to make this determination. A statistical approach may be used, subject to the availability and relevance of data, however sound engineering judgement must be used. For service history to be acceptable, the data must be both sufficient and pertinent.

The essentials of the process involve:

a. A clear understanding of the requirement airworthiness codes change and the purpose for the change and hazard addressed;

b. A determination based on detailed knowledge of the proposed design feature;

c. The availability of pertinent and sufficient service experience data, and

d. A comprehensive review of that service experience data.

2. Guidelines

The Certification Review Item (CRI) procedure (either a stand-alone CRI or included in the CRI A-1) would be used and the applicant should provide documentation to support the following:

a. The identification of the differences between the airworthiness codes in the existing basis and the airworthiness codes as amended, and the effect of the change in the airworthiness codes.

b. A description as to what aspect of the latest airworthiness codes the proposed changed product would not meet.

c. Evidence showing that the proposed type-certification basis for the changed product, together with applicable service experience, provides a level of safety consistent with complying with the latest airworthiness codes.

d. A description of the design feature and its intended function.

e. Data for the product pertinent to the airworthiness codes:

(1) Service experience from such sources as the following:

(a) Accident reports;
(b) Incident reports;
(c) Service Bulletins;
(d) Airworthiness directives;
(e) Repairs;
(f) Modifications;
(g) Flight hours/cycles for fleet leader and total fleet;

(h) World airline accident summary data;

(i) Service Difficulty Reports;

(j) Reports from accident investigation boards;

(k) Warranty, repair and parts usage data.

(2) Show that the data presented represents all relevant service experience for the product, including the results of any operator surveys, and is comprehensive enough to be representative.

(3) Show that the service experience is relevant to the hazard.

(4) Identification and evaluation of each of the main areas of concern, with regard to:

(a) recurring and/or common failure modes;

(b) cause;

(c) probability, by qualitative reasoning; and

(d) measures already taken and their effects.

(5) Relevant data pertaining to aircraft of similar design and construction may be included.

(6) Evaluation of failure modes and consequences through analytical processes. The analytical processes should be supported by:

(a) A review of previous test results; and

(b) Additional detailed testing as required; or

(c) A review aircraft functional hazard assessments (FHA) and any applicable system safety assessments (SSA) as required.

f. A conclusion that draws together the data and the rationale.

g. These guidelines are not intended to be limiting, either in setting required minimum elements or in precluding alternative forms of submission. Each case may be different, based on the particulars of the system being examined and the requirement to be addressed.

3. Example: Transport Airplanes: § 25.1141(f) Powerplant controls: Auxiliary Power Unit (APU) Fuel Valve Position Indication

NOTE: This example is taken from FAA certification experience gained, so references are made to FAR sections and amendments are kept.)

a. The following example, for transport airplanes (14 CFR § 25.1141(f) Auxiliary Power Unit (APU) Fuel Valve Position Indication System), illustrates the typical process an applicant follows. The process will be the same for all product types.

b. This example comes from a derivative model transport aeroplane where significant changes were made to the main airframe components, engines and systems, and APU. The baseline airplane has an extensive service history. The example shows how the use of service experience supports a finding that compliance with the latest requirement would not contribute materially to the level of safety, and that application of the existing type-

certification basis (or earlier amendment) would be appropriate. The example is for significant derivatives of transport airplanes with extensive service history, and illustrates the process, following the guidelines in this appendix, but does not include the level of detail normally required.

(1) Determine the differences between the requirement in the existing type-certification basis and the requirement as amended, and the effect of the change in the requirement.

The existing type-certification basis of the airplane that is being changed is the initial release of part 25. Amendment 25-40 added the requirement 14 CFR §25.1141(f), which mandates that power-assisted valves must have a means to indicate to the flight crew when the valve is in the fully open or closed position, or is moving between these positions. The addressed hazard would be risk of APU fire due to fuel accumulation caused by excessive unsuccessful APU start attempts.

(2) What aspect of the proposed changed product would not meet the latest requirements?

The proposed APU fuel valve position indication system does not provide the flight crew with fuel valve position or transition indication, and, therefore, does not comply with the requirements of 14 CFR §25.1141(f).

(3) Evidence that the proposed type-certification basis for the changed product, together with applicable service experience and other compliance measures provide an acceptable level of safety.

The APU fuel shut-off valve and actuator are unchanged from those used on the current family of airplanes, and have been found to comply with the earlier amendment 25-11 of 14 CFR §25.1141(f). The existing fleet has achieved approximately (#) flights during which service experience of the existing design has been found to be acceptable. If one assumes a complete APU cycle, i.e. start up and shutdown for each flight, the number of APU fuel shut off valve operations would be over 108 cycles, which demonstrates that the valve successfully meets its intended function and complies with the intent of the requirement. In addition, the system design for the changed product incorporates features, which increase the level of functionality and safety.

(4) A description of the design feature and its intended function

The fuel shut off valve, actuator design, and operation is essentially unchanged, with the system design ensuring that the valve is monitored for proper cycling from closed to open at start initiation. If the valve is not in the appropriate position (i.e., closed) then the APU start is terminated, an indication is displayed on the flight deck and any further APU starts are prevented. Design improvements using the capability of the APU Electronic Control Unit (ECU) have been incorporated in this proposed product change. These design changes ensure that the fuel valve indication system will indicate failure of proper valve operation to the flight crew, but the system does not indicate valve position as required by 14 CFR §25.1141(f).

(5) Data for the product pertinent to the requirement

The FAA and applicant record the data in an issue paper (G-1 or a technical issue paper). An issue paper was co-ordinated which included data, or referenced reports, documenting relevant service experience that has been compiled from incident reports, fleet flight hour/cycle data, and maintenance records. The issue paper also discussed existing and proposed design details, failure modes, and analyses showing to what extent the proposed aeroplane complies with the latest amendment of 14 CFR §25.1141. Information is presented to support the applicant's argument that compliance with the latest amendment would not materially increase the level of safety. Comparative data pertaining to aircraft of similar design and construction are also presented.

(6) Conclusion

Conclusion, drawing together the data and rationale, is documented in the G-1 issue paper. The additional features incorporated in the APU fuel shut-off valve will provide a significant increase in safety to an existing design with satisfactory service experience. The applicant proposes that compliance with the latest amendment would not materially increase the level of safety, and that compliance with 14 CFR §25.1141 at amendment 25-11 would provide an acceptable level of safety for the proposed product change.

## Appendix D to GM 21.101 Tables and figures to assist CPR understanding

**Figure 3: Affected and Unaffected area**

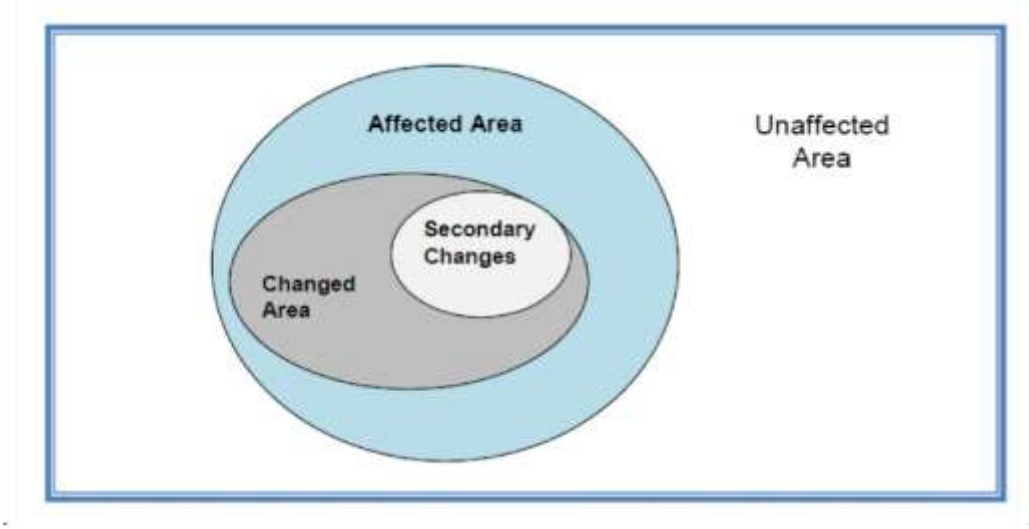


**Figure 4: Example of Related and Unrelated changes –Increase in Maximum Number of Passengers**

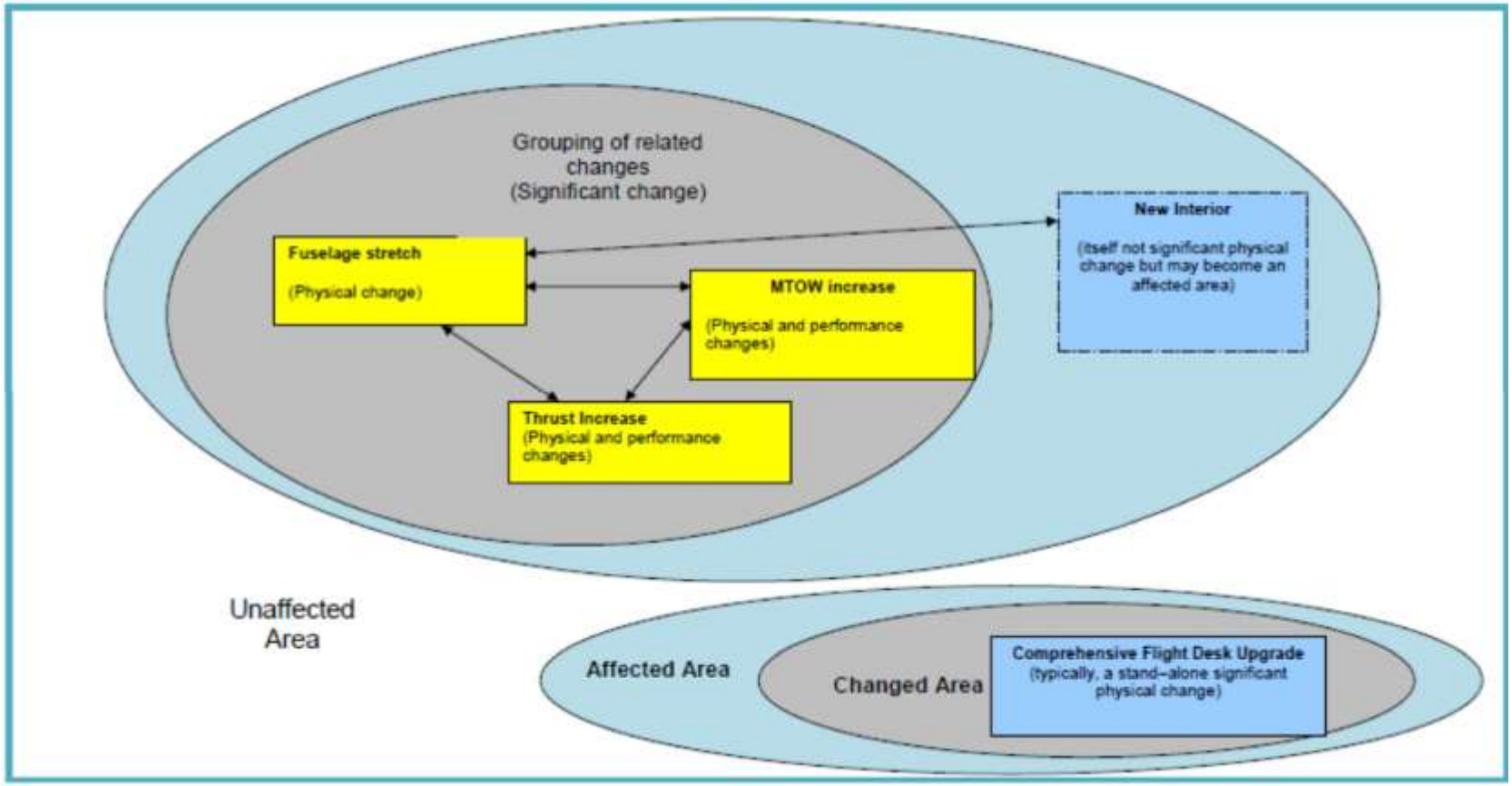


**Figure 5: Establishing TC basis for Substantial, Significant and Not significant changes according to 21.101 (a) and ((b)**

<table>
<tr><td>Substantial<br>(21.19)</td><td colspan="3">Significant<br>(21.101 (a) and (b))</td><td colspan="2">Not significant<br>(21.101(b)(1))</td></tr>
<tr><td rowspan="3">Full product<br><br>New demonstration of compliance for full changed product required.<br><br>Previously approved type design and compliance data may be allowed if valid for the changed product.</td><td colspan="2">Affected area<br>(Changed areas and/or physically unchanged but functionally affected areas)<br>New demonstration of compliance is required</td><td rowspan="2">Unaffected area<br>No new demonstration of compliance is required.<br>Unaffected area continues to comply with the existing TC basis.<br>The applicant may elect to comply with later airworthiness codes.</td><td rowspan="2">Affected area<br>(Changed areas and/or physically unchanged but functionally affected areas).<br>New demonstration of compliance is required.<br>The applicant may propose a certification basis using an earlier amendment but not earlier than the existing TC basis.</td><td rowspan="2">Unaffected area<br>No new demonstration of compliance is required.<br>Unaffected area continues to comply with the existing TC basis.<br>The applicant may elect to comply with later airworthiness codes</td></tr>
<tr><td colspan="2">Compliance with the latest amendment materially contributes to safety</td><td>No material contribution to safety</td></tr>
<tr><td>(Practical)</td><td>Impractical<br>The applicant may propose a certification basis using an earlier amendment but not earlier than the existing TC basis.</td><td>Secondary and not secondary<br>The applicant may propose a certification basis using an earlier amendment but not earlier than the existing TC basis.</td><td></td><td></td></tr>
<tr><td colspan="6">TC basis proposed by the Applicant</td></tr>
<tr><td colspan="2">Airworthiness codes of the latest amendment<br>+ elects to comply</td><td colspan="2">Airworthiness codes of an earlier amendment<br>+ elects to comply</td><td>Elects to comply<br>(later than the existing TC basis</td><td>An earlier amendment<br>+ elects to comply</td><td>Elects to comply<br>(later than the existing TC basis)</td></tr>
<tr><td colspan="6">TC basis recorded by the DGCA</td></tr>
<tr><td>Airworthiness codes of<br>the latest amendment<br>+ SC<br>(if the latest amendment is not adequate)<br>+ elects to comply</td><td>Airworthiness codes of the proposed amendment<br>or,<br>if not adequate, the first appropriate later amendment (if available)<br>or<br>SC + elects to comply</td><td>Airworthiness codes of the proposed amendment (if adequate)<br>or,<br>if not adequate, the first appropriate later amendment (if available)<br>or<br>SC + elects to comply</td><td>Elects to comply<br>as proposed</td><td>The proposed amendment (if adequate)<br>or<br>First appropriate later amendment (if available)<br>or<br>SC + elects to comply</td><td>Elects to comply as proposed</td></tr>
</table>

**Figure 6: Establishing TC basis for a change on Excepted Products (21.101(c))**

<table>
<tr><td colspan="4">Affected area<br>(Changed areas and/or physically unchanged but functionally affected areas)<br>New demonstration of compliance is required</td><td>Unaffected area<br>No new demonstration of compliance is required.<br>Unaffected area continues to comply with the existing TC basis.<br>The applicant may elect to comply with later airworthiness codes.</td></tr>
<tr><td colspan="5">TC basis proposed by the Applicant</td></tr>
<tr><td colspan="4">The existing TC basis + elects to comply</td><td>Elects to comply<br>(later than the existing TC basis)</td></tr>
<tr><td colspan="3">Found by the DGCA ‘significant in an area’</td><td>(Not significant in an area)</td><td></td></tr>
<tr><td colspan="2">Compliance with a later amendment materially contributes to safety</td><td rowspan="2">No material contribution to safety</td><td></td><td></td></tr>
<tr><td>(Practical)</td><td>Impractical</td><td></td><td></td></tr>
<tr><td colspan="5">TC basis recorded by the DGCA</td></tr>
<tr><td>Airworthiness codes of<br>a later amendment designated by the DGCA + SC + elects to comply</td><td>The existing TC basis<br>or,<br>if not adequate, the first appropriate later amendment<br>(if available)<br>or<br>(if not) SC + elects to comply</td><td>The existing TC basis<br>or,<br>if not adequate, the first appropriate later amendment (if available)<br>or<br>(if not) SC +elects to comply</td><td>The existing TC basis<br>or,<br>if not adequate, the first appropriate later amendment (if available)<br>or<br>(if not) SC +elects to comply</td><td>Elects to comply<br>(later than the existing TC basis)</td></tr>
</table>

**Appendix E to GM 21.101 Related CAR 21 Requirements**

21.16A Airworthiness codes

21.16 B Special conditions

21.17 Type-certification basis

21.18 Designation of applicable environmental protection requirements and airworthiness codes

21.19 Changes requiring a new type-certificate

21.21 Issue of a type-certificate

21.23 Issue of a restricted type-certificate

21.90 Scope

21.91 Classification of changes in type design

21.93 Application

21.95 Minor changes

21.97 Major changes

21.101 Designation of applicable airworthiness codes and environmental protection requirements

21.103 Issue of approval

21.111 Scope

21.113 Application for a supplemental type-certificate

21.114, Demonstration of compliance

21.115 Issue of a supplemental type-certificate

21.117 Changes to that part of a product covered by a supplemental type-certificate

21.604 ITSO Authorisation for an auxiliary power unit (APU)

# Subpart E – Supplemental Type-Certificates

**GM 21.112BDemonstration of capability for supplemental type-certificate cases**

See also AMC 21.14(b) for the details of the alternative procedures.

The following examples of major changes to type design (ref: CAR 21.91) are classified in two groups. Group 1 contains cases where a design organisation approved under CAR 21 Subpart JA ("Subpart JA-DOA") should be required and Group 2 cases where the alternative procedure may be accepted. They are typical examples but each STC case should be addressed on its merits and there would be exceptions in practice. This classification is valid for new STCs, not for evolution of STCs, and may depend upon the nature of the STC (complete design or installation).

| Product | Discipline | Kind of STC | Group |
|---|---|---|---|
| CS-23/FAR-23 (products where JA - DOA is required for TC) | | | |
| Notes :<br>* STC which leads to reassess the loads on large parts of primary structure should be in group 1.<br>* 2/1 means that an assessment of consequences in terms of handling qualities, performance or complexity of demonstration of compliance may lead to classification in group 1. | | | |
| | Aircraft | | |
| | | Conversion to tail wheel configuration | 1 |
| | | Auxiliary fuel tank installations | 2/1 |
| | | Glass fiber wing tips | 2/1 |
| | | Fairings: nacelle, landing gear | 2 |
| | | Gap seals: aileron, flap, empennage, doors | 2 |
| | | Vortex generators | 2/1 |
| | | Spoiler installation | 1 |
| | | Increase in MTOW | 1 |
| | Structures | | |
| | | Stretcher installation | 2 |
| | | Change to seating configuration | 2 |
| Product | Discipline | Kind of STC | Group |

| | | | |
|---|---|---|---|
| | | Windshield replacement (heated, single piece, etc) | 2 |
| | | Light weight floor panels | 2 |
| | | Ski installations | 2/1 |
| | Propulsion | | |
| | | Engine model change | 1 |
| | | Fixed pitch propeller installation | 2 |
| | | Constant speed propeller installation | 2/1 |
| | | Installation of exhaust silencer | 2 |
| | | Installation of Graphic engine monitor | 2 |
| | | Installation of fuel flow meter | 2 |
| | | Accessory replacement (alternator, magnetos, etc.) | 2 |
| | | Inlet modifications: oil cooler; induction air | 2 |
| | Equipment | | |
| | | Avionics upgrades (EFIS, GPS, etc) | 2/1 |
| | | Engine instrument replacements | 2 |
| | | Carburetor ice detection system | 2 |
| | | Autopilot system installation | 1 |
| | | Wing tip landing light; recognition lights | 2 |
| | | WX radar installation | 2 |
| | | Aeromedical system installations | 2 |
| | | De- and anti-ice system installations | 1 |
| | | Emergency power supply installations | 2 |
| CS-25 / FAR-25 | | | |
| | Cabin Safety | | |
| Note : Basically all changes related to cabin configuration should be in Group 2. | | Cabin layout (installation of seats (16G), galleys, single class or business / economy class, etc) | 2 |
| | | Floor path marking | 2 |
| | | Crew rest compartment | 1 |

| | | | |
|---|---|---|---|
| | | Change of cargo compartment classification (from class D to class C) | 1 |
| | Structure | | |
| Note : STC which leads to reassess the loads on large parts of primary structure should be in Group 1. | | Cargo door | 1 |
| | | Change from Passenger to Freighter configuration | 1 |
| | Avionics | | |
| Notes : For CS-25 / FAR-25 products, the existence of ITSO/ETSO/TSO is not taken into account for the classification ; Impact on aircraft performance, and influence of aircraft performance are criteria to assess the classification ; Subjective assessment of human factors is considered for determination of classification. | | CVR | 2 |
| | | VHF | 2 |
| | | NAV (ADF, VOR, GPS, BRNAV) | 2 |
| | | Autopilot, HUD, EFIS, FMS | 1 |
| | | DFDR | 2/1 |
| | | Meteo radar | 2 |
| | | ILS Cat 3 | 1 |
| | | RVSM | 1 |
| | | TCAS, EGPWS | 1 |
| | | GPWS | 2 |
| | Powerplant | | |
| | | Auxiliary fuel tanks | 1 |
| | | Thrust Reverser system | 1 |
| | | Hushkit | 1 |
| | | Fire detection | 1 |
| | | Fuel gauging | 1 |
| | | Change of Engine or Propeller | 1 |
| CS-27 or 29 / FAR-27 or FAR-29 | All disciplines | | |
| Note : 2/1 means that an assessment of consequences in terms of handling qualities and performance may lead to classification in Group 1. | | Main rotor or tail rotor blades replacement | 1 |
| | | Autopilot | 1 |
| | | Engine type change | 1 |
| | | GPS installation | 2 |
| | | Jettisonable overhead raft installation | 2 |
| | | Utility basket installation | 2/1 |

| | | |
|---|---|---|
| | Nose or side mount camera installation | 2/1 |
| | Passenger access step installation | 2/1 |
| | Protection net & handle installation (parachuting) | 2 |
| | VIP cabin layout | 2 |
| | Navigation system installation | 2 |
| | Fuel boost pump automatic switch-on installation | 2 |
| | Decrease of maximum seating capacity | 2 |
| | Agricultural spray kit installation | 2/1 |
| | Long exhaust pipe installation | 2 |
| | Flotation gear installation | 2/1 |
| | Wipers installation | 2 |
| | Engine oil filter installation | 2 |
| | Skid gear covering installation | 2/1 |
| | Gutter installation (top pilot door) | 2 |
| | Cable cutter installation | 2 |
| | Auxiliary fuel tank fixed parts installation | 2 |
| | Cabin doors windows replacement | 2 |
| | Radio-altimeter aural warning installation | 2 |
| | Stand-by horizon autonomous power supply | 2 |
| | Fire attack system | 2/1 |
| | Hoisting system installation | 2/1 |
| | External loads hook installation | 2 |
| | Emergency flotation gear installation | 2/1 |
| | Heating/demisting (P2 supply) | 2 |

**AMC 21.114 Compliance demonstration process for Supplemental Type-Certificate**

1. AMC/GM to 21.20 should be used for a supplemental type-certificate.

2. For major changes approved under a supplemental type-certificate and not requiring long and complex compliance demonstration activities, a certification programme, as described in AMC 21.20(b), can be submitted with the application in a simplified format. The certification programme should contain at least the following elements:

- Purpose of change
- Description of change
- Applicability
- Applicable airworthiness codes, special conditions, equivalent safety findings and environmental protection requirements
- The description on how compliance will be demonstrated, with selected means of compliance (see appendix to AMC 21.20(b) for the codes to be used) and reference to compliance documents
- As appropriate, the involvement of the type-certificate holder of the product on which the STC is proposed (see 21.113 and 115).
- If relevant, the delivery schedule of compliance documents.

# Subpart F – Production without production organisation approval

**GM No. 1 to 21.121Applicability - Individual product, part or appliance**

In this context, "demonstrating the conformity with the applicable design data of a product, part and appliance" means that conformity with the applicable design data has to be established and shown for each and every product, part, or appliance produced.

**GM No. 2 to 21.121Applicability – Applicable design data**

Applicable design data is defined as all necessary drawings, specifications and other technical information provided by the applicant for, or holder of a design organisation approval, TC, STC, approval of repair or minor change design, or ITSO authorisation (or equivalent when CAR 21, Subpart F is used for production of products, parts or appliances, the design of which has been approved other than according to CAR 21), and released in a controlled manner to the manufacturer producing under CAR 21, Subpart F. This should be sufficient for the development of production data to enable manufacture in conformity with the design data.

Prior to issue of the TC, STC, approval of repair or minor change design or ITSO authorisation, or equivalent, design data is defined as 'not approved', but parts and appliances may be released with a Form CA-1 as a certificate of conformity.

After issue of the TC, STC, approval of repair or minor change or ITSO authorisation, or equivalent, this design data is defined as 'approved' and items manufactured in conformity are eligible for release on a Form CA-1for airworthiness purposes.

For the purpose of Subpart F of CAR 21 the term 'applicable design data' includes, in the case of engines and when applicable, the information related to the applicable emissions production cut-off requirement

**AMC No. 1 to 21.122Eligibility – Link between design and production**

An "arrangement" is considered suitable if it is documented and satisfies DGCA that coordination is satisfactory.

To achieve satisfactory co-ordination, the documented arrangements must at least define the following aspects irrespective of whether the design organisation and the person producing or intending to produce under CAR 21, Subpart F, are separate legal entities or not:

1. The responsibilities of a design organisation which assure correct and timely transfer of up-to-date applicable design data (e.g., drawings, material specifications, dimensional data, processes, surface treatments, shipping conditions, quality requirements, etc.);

2. The responsibilities and procedures of the manufacturer for receiving, managing and using the applicable design data provided by the design organization;

3. The responsibilities and procedures of the manufacturer for developing, where applicable, its own manufacturing data in compliance with the applicable design data package;

4. The responsibilities of the manufacturer, to assist the design organization, in dealing with continuing airworthiness matters and for required actions (e.g., traceability of parts in case of direct delivery to users, retrofitting of modifications, traceability of processes' outputs and approved deviations for individual parts as applicable, technical information and assistance, etc.);

5. The scope of the arrangements covering Subpart F requirements, in particular: CAR 21.126A(a) (4) and CAR 21.129(d) and (f) and any associated GM or AMC;

6. The responsibilities of the manufacturer, in case of products prior to type certification to assist a design organisation in showing compliance with CS / FAR (access and suitability of production and test facilities for manufacturing and testing of prototype models and test specimen);

7. The procedures to deal adequately with production deviations and non-conforming parts;

8. The means to achieve adequate configuration control of manufactured parts, to enable the manufacturer to make the final determination and identification for conformity or airworthiness release and eligibility status;

9. The identification of responsible persons/offices who controls the above;

10. The acknowledgment by the holder of the TC/STC/repair or change approval/ITSO authorisation that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved.

In many cases the person producing or intending to produce under CAR 21, Subpart F may receive the approved design data through an intermediate production organisation. This is acceptable provided an effective link between the design approval holder and the production organisation can be maintained to satisfy the intent of CAR 21.122.

When the design organisation and the manufacturer are two separate legal entities a Direct Delivery Authorisation should be available, for direct delivery to end users, in order to guarantee continued airworthiness control of the released parts and appliances.

Where there is no general agreement for Direct Delivery Authorisation, specific permissions may be granted (see AMC 21.4).

**AMC No. 2 to 21.122Eligibility – Link between design and production**

In accordance with AMC No.1 to 21.122 the person producing or intending to produce under CAR 21, Subpart F should demonstrate to the authority that it has entered into an arrangement with the design organisation. The arrangement must be documented irrespective of whether the two organisations are separate legal entities or not.

The documented arrangement must facilitate the person producing or intending to produce under CAR 21, Subpart F, to demonstrate compliance with the requirement of CAR 21.122 by means of written documents agreed.

In the case where the design organisation and the person producing or intending to produce under CAR 21 Subpart F are part of the same legal entity these interfaces may be demonstrated by company procedures acceptable to DGCA.

In all other cases to define such a design/production interface the following sample format is offered:

Arrangement Sample Form

| **ARRANGEMENT**<br>In accordance with CAR 21.122 | |
|---|---|
| The undersigned agree on the following commitments: | relevant interface procedures |
| The design organisation [NAME] takes responsibility to<br>• assure correct and timely transfer of up-to-date applicable design data (e.g., drawings, material specifications, dimensional data, processes, surface treatments, shipping conditions, quality requirements, etc.) to the person producing under CAR 21, Subpart F [NAME]<br>• provide visible statement(s) of approved design data | |
| The person producing under CAR 21, Subpart F [NAME] takes responsibility to<br>• assist the design organisation [Name] in dealing with continuing airworthiness matter and for required actions<br>• Assist the design organisation [Name] in case of products prior to type certification in showing compliance with certification requirements<br>• develop, where applicable, its own manufacturing data in compliance with the airworthiness data package | |
| The design organisation [Name] and the person producing under CAR 21 Subpart F [Name] take joint responsibility to<br>• deal adequately with production deviations and non conforming parts in accordance with the applicable procedures of the design organisation and the manufacturer producing under CAR 21, Subpart F.<br>• achieve adequate configuration control of manufactured parts, to enable the manufacturer producing under CAR 21, Subpart F to make the final determination and identification for conformity or airworthiness release and eligibility status. | |
| The scope of production covered by this arrangement is detailed in……[DOCUMENT REFERENCE/ ATTACHED LIST] | |
| [When the design organisation is not the same legal entity as the manufacturer producing under CAR 21 Subpart F ] | |

**Transfer of approved design data**

The TC/STC/ITSO authorisation holder [NAME] acknowledges that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved by the DGCA and therefore the parts and appliances manufactured in accordance with these data and found in a condition for safe operation. may be released certifying that the item was manufactured in conformity to approved design data and is in a condition for safe operation.

[When the design organisation is not the same legal entity as the manufacturer producing under CAR 21, Subpart F]

**Direct Delivery Authorisation**

This acknowledgment includes also [OR does not include] the general agreement for direct delivery to end users in order to guarantee continued airworthiness control of the released parts and appliances.

| for the [NAME of the design organisation/ DOA holder] | for the [NAME of the person producing under CAR 21, Subpart F] |
|---|---|
| date signature<br>xx.xx.xxxx<br>([NAME in block letters]) | date signature<br>xx.xx.xxxx<br>([NAME in block letters]) |

**Instructions for completion:**

**Title:** The title of the relevant document must clearly indicate that it serves the purpose of a design/production interface arrangement in accordance with CAR 21.122.

**Commitment:** The document must include the basic commitments between the design organisation and the manufacturer producing under CAR 21, Subpart F as addressed in AMC 21.4 and AMC No. 1 to 21.122.

**Relevant Procedures:** Identify an entry point into the documentary system of the organisations with respect to the implementation of the arrangement (for example a contract, quality plan, handbooks, common applicable procedures, working plans etc.).

**Scope of arrangement:** The scope of arrangement must state by means of a list or reference to relevant documents those products, parts or appliances that are covered by the arrangement.

**Transfer of approved design data:** Identify the relevant procedures, for the transfer of the applicable design data, required by CAR 21.122 and AMC No. 1 to 21.122from the design organisation to the person producing under CAR 21, Subpart F. The means by which the design organisation advises the person producing under CAR 21, Subpart F, whether such data is approved or not approved must also be identified (ref. CAR 21.4 / AMC 21.4).

**Direct Delivery Authorisation**: Where the design organisation and the person producing under CAR 21, Subpart F are separate legal entities the arrangement must clearly identify whether authorization, for direct delivery to end users, is permitted or not.

Where any intermediate production/design organisation is involved in the chain between the original design organisation and the person producing under CAR 21, Subpart F, evidence must be available that this intermediate organisation has received authority from the design organisation to grant Direct Delivery Authorisation.

**Signature:** AMC No. 1 to 21.122requests the identification of the responsible persons/offices who control the commitments laid down in the arrangement. Therefore the basic document must be signed mutually by the authorised representatives of the design organisation and the manufacturer producing under CAR 21, Subpart F in this regard.

**GM 21.124(a) Application – Application form**

DGCA Form 60 should be obtained from DGCA (or DGCA website) and completed by the applicant.

An application may be accepted from:

- An individual applying on his or her own behalf, or

- In the case of an organisation, an individual with the DGCA to make agreements on behalf of the organisation.

The completed form should be forwarded to DGCA.

**GM 21.124(b) (1) (i) Applicability - Inappropriate approval under Subpart G**

The issue of a letter of agreement of production under CAR 21, Subpart F may be agreed by DGCA when:

1. The applicant produces or intends to produce aeronautical products, parts, and/or appliances, intended for airborne use, as part of a type-certificated product (this excludes simulators, ground equipment and tools), and

2. DGCA determines that CAR 21,Subpart G would be inappropriate, and consequently CAR 21, Subpart F applies. The main difference between CAR 21, Subpart G and F is that, Subpart G requires the existence of a Quality System which provides DGCA with the necessary confidence to grant to the manufacturer the privileges of certifying its own production. There are situations where a Quality System, including independent monitoring and continuous internal evaluation functions, is not justified and /or feasible. In making the determination that Subpart F may apply, DGCA may take into account one or a combination of parameters such as the following:

    - no flow production (infrequent or low volume of production);

    - simple technology (enabling effective inspection phases during the manufacturing process);

    - very small organisation.

**GM 21.124(b) (1) (ii) Certification or approval needed in advance of the issue of a POA**

In cases where CAR 21, Subpart G is applicable, but when some time is needed for the organisation to achieve compliance with Subpart G, i.e., to establish the necessary documented quality system, DGCA may agree to use CAR 21, Subpart F for a limited period (transient phase).

In cases where CAR 21, Subpart G is applicable, such as to produce ITSO articles, a letter of agreement to produce under CAR 21, Subpart F should not be given unless an application has been made for organisation approval under Subpart G, and reasonable progress is being made towards compliance with Subpart G. Long-term production under CAR 21, Subpart F will not be permitted.

**GM 21.124(b) (2) Application - Minimum information to include with the application**

At this early stage, provision of the complete manual is not necessary, but at least the following items should be covered:

1. Table of contents of the manual (including list of existing inspection system documents or procedures);

2. Description of items to be manufactured (including intended quantities/deliveries);

3. List of possible suppliers;

4. General description of facilities;

5. General description of production means;

6. Human resources.

7. Name and bio-data of a responsible person in the organisation, to be approved by DGCA as Authorised Signatory, to validate Statement of Conformity (Form CA-52) and Authorised Release Certificate (Form CA-1).

8. Description of quality assurance and independent monitoring function existing in the organization.

**GM No. 1 to 21.125A Letter of agreement - Meaning of individual**

"Individual" means that each part number or type of item (i.e., product, part, or appliance) to be produced should be specifically referenced, either directly or through a referenced capability list, in the letter of agreement from DGCA. The letter may also specify any limitation in the production rate.

**GM No. 1 to 21.125A (b) Letter of agreement - Contents of the Manual**

The manual referred in CAR 21.125A (b) should include, at least the following information:

1. Declaration by the applicant of undertaking in respect of

    1.1 the requirements defined in CAR 21 ,Subpart F,

    1.2 the procedures contained in the manual and in the documentation mentioned herein,

    1.3 every legal provision laid down for the carrying on of the business activities (statutory declaration);

2. Declaration by the applicant certifying the conformity of the manual to the requirements defined in CAR 21 Subpart F;

3. Jobs, power and responsibilities of the accountable personnel;

4. Organisation chart, if required by DGCA;

5. Description of the resources, including human resources, with an indication of the personnel qualification criteria;

6. Description of location and equipment;

7. Description of the scope of work, the production processes and techniques, and reference to the "capability list";

8. Communications with DGCA, and specifically those required by CAR 21.125A(c);

9. Assistance and communication with the design approval holder, and the means of compliance with CAR 21.125A (c);

10. Amendments to the manual;

11. Description of the Inspection System (including test, see GM No. 2 to 21.125A(b), and 21.127 and 21.128), and the procedures to meet CAR 21.126A and associated GM;

12. List of suppliers;

13. Name and bio-data of DGCA approved-Authorized signatory to validate Statement of Conformity and Authorised Release Certificate.

14. Description of quality assurance and independent monitoring function of the organization.

If the information is listed in the manual in a different order a cross reference to the above list should be made available in the manual.

**NOTE:** The DGCA – approved Authorized signatory and person responsible for Independent monitoring function should report to the Accountable Manager or person of equivalent rank.

**GM No. 2 to 21.125 A (b) Letter of agreement - Production Inspection System: Functional Tests**

All items produced should be subject to inspection, to be carried out at suitable phases, which permit an effective verification of conformity with the design data.

These inspections may provide for the execution of tests to measure performances as set out in the applicable design data.

Considerations of complexity of the item and/or its integration in the next level of production will largely determine the nature and time for these tests, for example:

- appliances - will require full functional testing to the specifications,
- parts - will at least require basic testing to establish conformity, but due allowance may be made for further testing carried out at the next level of production,
- material - will require verification of its stated properties,

**GM 21.125 A (c)Letter of agreement - Assistance**

DGCA should be provided with material which defines the means of providing assistance as required by CAR 21.125A(c). Suitable descriptive material should be included in the manual, as described in GM No. 1 to 21.125A(b).

**GM 21.125 A (d) Letter of Agreement - Authorised Signatory**

a) The organisation shall propose a name (with bio-data) of a responsible person to approve him/her as Authorised Signatory of the organization producing/intending to produce product, parts and appliances under CAR 21, Subpart F. After examining the bio-data, DGCA may approve that person as DGCA-approved Authorised Signatory of the organisation.

b) The proposed Authorised signatory should have, preferably, 10 years of experience in a reputed production/manufacturing organisation, of which a minimum of 5 years of experience should be in a production / manufacturing organisation for aeronautical products.

c) The authorised signatory approved by DGCA should validate the Statement of Conformity (Form CA-52) and Authorised Release Certificate (Form CA-1) issued/ signed by certifying staff and submit it to DGCA.

d) The responsibility of Authorised signatory is to ensure that the product/part/appliances which is validated by him/her, conforms to approved design data and comply with safety requirements.

e) DGCA is empowered to cancel the approval of Authorised signatory, if it finds him/her, not performing the designated responsibility/functions satisfactorily.

**GM No. 1 to 21.125B (a) Uncontrolled non-compliance with applicable design data**

An uncontrolled non-compliance with applicable design data is a non-compliance:

- that cannot be discovered through systematic analysis or
- that prevents identification of affected products, parts, appliances, or material

**GM No. 2 to 21.125B (a) Examples for level one findings**

Examples for level 1 findings are non-compliances with any of the following paragraphs, that could affect the safety of the aircraft:

CAR 21.126A, CAR 21.126B, CAR 21.127, CAR 21.128, CAR 21.129.

It should be anticipated that a non-compliance with these paragraphs is only considered a level one finding when objective evidence has been found that, this finding is an uncontrolled non-compliance that could affect the safety of the aircraft.

**GM 21.126AProduction Inspection System**

GM 21.126A (a) and (b) has been developed, for persons producing under CAR 21, Subpart F, on the long term basis as defined in CAR 21.124(b)(1)(i).

For those persons producing under CAR 21, Subpart F, as a transient phase under CAR 21.124(b)(1)(ii), compliance with CAR 21.126A may also be demonstrated, to the satisfaction of DGCA, by using the equivalent CAR 21, Subpart G -AMC/GM.

**GM 21.126A(a) (1)Production Inspection System – Conformity of supplied parts, appliances and materials.**

1. The person producing under Subpart F, is responsible for determining and applying acceptance standards for physical condition, configuration status and conformity, as appropriate, of raw materials, subcontracted works, and supplied products, parts, appliances or materials, whether to be used in production or delivered to customers as spare parts. This responsibility also includes BFE (Buyer Furnished Equipment) items.

2. Control may be based upon use of the following techniques, as appropriate:

   2.1 first article inspection, including destruction if necessary, to verify that the article conforms to the applicable data, for new production line or new supplier,

   2.2 incoming inspections and tests of supplied parts or appliances that can be satisfactorily inspected on receipt,

   2.3 identification of incoming documentation and data relevant to the showing of conformity to be included in the certification documents,

   2.4 any additional work, tests or inspection which may be needed for parts or appliances, which are to be delivered as spare parts and which are not subject to the checks normally provided by subsequent production or inspection stages.

3. The person producing under CAR 21, Subpart F, may rely upon Form CA-1 issued in accordance with CAR 21, if provided as evidence of conformity with applicable design data

4. For suppliers not holding a POA, the inspection system of the person producing under CAR 21, Subpart F, should establish a system for control of incoming materials and bought or subcontracted items, which provides for inspections and tests of such items by the person , producing under CAR 21, Subpart F, at the supplier's facility, if the item cannot or will not be completely inspected upon receipt.

**GM 21.126A(a) (2)Production Inspection System - Identification of incoming materials and parts**

All parts and materials coming from external parties should be identified and inspected to ascertain that, they have not been damaged during transport or unpacking, that the incoming parts and materials have the appropriate and correct accompanying documentation, and that the configuration and condition of the parts or materials is as laid down in that documentation.

Only on completion of these checks and of any incoming further verifications laid down in the procurement specification, may the part or material be accepted for warehousing and used in production.

This acceptance should be certified by an inspection statement.

A suitable recording system should allow reconstruction at any time of the history of every material or part.

The areas where the incoming checks are carried out and the materials or parts are stored pending completion of the checks should be physically segregated from other departments.

**GM No. 1 to 21.126A(a) (3)Production Inspection System - List of specifications**

It is the responsibility of:

1. The designer, to define all necessary processes, techniques and methods to be followed during manufacture (CAR 21.31) and this information will be provided as part of the applicable design data.

2. The manufacturer, to ensure that all processes are carried out strictly in accordance with the specifications provided, as part of the applicable design data.

**GM No. 2 to 21.126A(a) (3)Production Inspection System - Means of checking of the production processes**

The Production Inspection System should be provided with appropriate means of checking that production processes, whether performed by the person producing under CAR 21, Subpart F, or by subcontractors under its control, are carried out in accordance with applicable data, including:

1. A system for the control and authorised amendment of data provided for the production, inspection and test to ensure that it is complete and up-to-date at the point of use;

2. Availability of personnel with suitable qualification, experience, and training for each required production, inspection, and test task. Special attention should be paid to tasks requiring specialized knowledge and skill, e.g., NDT / NDI, welding etc.

3. A working area where the working conditions and environment are controlled as appropriate in respect of: cleanliness, temperature, humidity, ventilation, lighting, space/access, protection against noise and pollution;

4. Equipment and tools sufficient to enable all specified tasks, to be accomplished in a safe and effective manner without detrimental effect on the items under production. Calibration control of equipment and tools, which affect critical dimensions and values, must show compliance with, and be traceable to, recognised national or international standards.

**GM 21.126A(a)(4)Production Inspection System – Applicable design/production data procedures**

1. When a person, producing under CAR 21, Subpart F, is developing its own manufacturing data from the design data package delivered by a Design holder, procedures should demonstrate the correct transcription of the original design data.

2. Procedures should define the manner in which applicable design data is used to issue and update the production/inspection data, which determines the conformity of products, parts, appliances and materials. The procedure should also define the traceability of such data to each individual product, part, appliance or material for the purpose of stating the condition for safe operation and for issuing a Statement of Conformity.

3. During execution, all works should be accompanied by documentation giving either directly or by means of appropriate references, the description of the works as well as the identification of the personnel in charge of inspection and execution tasks, for each of the different work phases.

**GM 21.126A(b)(1)Production Inspection System - Inspection of parts in process**

The purpose of the Production Inspection System is to check at suitable points during production and provide objective evidence that the correct specifications are used, and that processes are carried out strictly in accordance with the specification.

During the manufacturing process, each article should be inspected in accordance with a plan, which identifies the nature of all inspections required and the production stages at which they occur. The plan should also identify any particular skills or qualification required for person(s) carrying out the inspections (e.g., NDT personnel). A copy of the plan should be included in, or referenced by, the manual required by CAR 21.125A(b).

If the parts are such that, if damaged, they could compromise the safety of the aircraft, additional inspections for such damage should be performed at the completion of each production stage.

**GM 21.126A(b)(2)Production Inspection System – Suitable storage and protection**

1. Storage areas should be protected from dust, dirt, or debris, and adequate blanking and packaging of stored items should be practiced.

2. All parts should be protected from extremes of temperatures and humidity and, where needed, temperature-controlled or full air-conditioned facilities should be provided.

3. Racking and handling equipment should be provided such as to allow storage, handling and movement of parts without damage.

4. Lighting should be such as to allow, safe and effective access and handling, but should also cater for items which are sensitive to light e.g., rubber items.

5. Care should be taken to segregate and shield items which can emit fumes (e.g., wet batteries), substances or radiation (e.g., magnetic items) which are potentially damaging to other stored items.

6. Procedures should be in place to maintain and record stored parts identities and batch information.

7. Access to storage areas should be restricted to authorised personnel, who are fully trained to understand and maintain the storage control arrangements and procedures.

8. Provisions should be made for segregated storage of non conforming items which are pending for disposition (see GM 21.126A(b)(4)).

**GM 21.126A(b)(3)Production Inspection System – Use of derived data instead of original design data**

Where derived data, e.g., worksheets, process sheets, fabrication/inspection instructions, etc., is used instead of original design drawings, documents identification and control procedures should be used to ensure that the documentation in use is always accurate and current.

**GM 21.126A(b)(4)Production Inspection System – Segregation of rejected material**

All materials and parts which have been identified at any stage in the manufacturing process as not conforming to the specific working and inspection instructions, must be suitably identified by clearly marking or labelling, to indicate their non-conforming status.
All such non-conforming materials or parts should be removed from the production area and held in a restricted access segregated area, until an appropriate disposition is determined in accordance with CAR 21.126A(b)(5).

**GM 21.126A(b)(5)Production Inspection System – Engineering and manufacturing review procedure**

1. The procedure should permit to record the deviation, to present it to the design holder under the provisions of CAR 21.122, and to record the results of the review and actions taken consequently as regards the part/product.

2. Any unintentional deviation from the manufacturing/inspection data should be recorded and handled in accordance with CAR 21, Subpart D or E as changes to the approved design.

**GM 21.126A(b)(6)Production Inspection System – Recording and record keeping**

1. Records within a production environment satisfy two purposes. Firstly, they should, during the production process to ensure that products, parts, or appliances are in conformity with the controlling data throughout the manufacturing cycle. Secondly, certain records of milestone events are needed to subsequently provide objective evidence that, all prescribed stages of the production process have been satisfactorily completed and that, compliance with the applicable design data has been achieved.

   Therefore, the person producing under CAR 21, Subpart F, should implement a system for the compilation and retention of records during all stages of manufacture, covering short-term and long-term records appropriate to the nature of the product and its production processes.

   The management of such information should be subject to appropriate documented procedures in the manual required by CAR 21.125A(b).

All forms of recording media are acceptable (paper, film, magnetic etc.) provided they can meet the required duration for archiving under the conditions provided.

2. The related procedures should:

2.1 Identify records to be kept,

2.2 Describe the organisation of and responsibility for the archiving system (location, compilation, format) and conditions for access to the information (e.g., by product, subject),

2.3 Control access and provide effective protection from deterioration or accidental damage,

2.4 Ensure continued readability of the records,

2.5 Demonstrate to DGCA proper functioning of the records system,

2.6 Clearly identify the persons involved in conformity determination,

2.7 Define an archiving period for each type of data taking into account importance in relation to conformity determination subject to the following:

a. Data which supports conformity of a product, part, or appliance should be kept for not less than three years, from the issue date of the related Statement of Conformity or Authorised Release Certificate;

b. Data considered essential for continuing airworthiness should be kept throughout the operational life of the product, part or appliance.

2.8 Data related to supplied parts may be retained by the supplier, if the supplier has a system agreed under CAR 21, Subpart F by DGCA. The manufacturer should, in each case, define the archiving period and satisfy himself or herself and DGCA, that the recording media are acceptable.

**GM No. 1 to 21. 126BIndependent Monitoring Function**

The production inspection system which is part of the organisation is required to be independent from the functions being monitored. This required independence relates to the lines of reporting, authority and access within the organisation and assumes an ability to work without technical reliance on the monitored functions.

**GM No. 2 to 21.126BAdequacy of procedures and monitoring function**

Adequacy of procedures means that the inspection system, through the use of the procedures as set forth, is capable of meeting the conformity of the product, parts, appliances and materials. The independent monitoring function is to perform planned continuing and systematic evaluations or audits of factors that affect the conformity

(and, where required, safe operation) of the products, parts, appliances and/or materials to the applicable design. This evaluation or audits should include all elements of the applicable procedures/system in order to show compliance with CAR 21, Subpart F.

**GM 21.126D Investigation- Arrangements**

The arrangements made by the applicant for, or holder of an approval under CAR 21 Subpart F should allow DGCA to make investigations that include the complete production organisation including partners, sub-contractors and suppliers, whether they are in India or not.

The investigation may include; audits, enquiries, questions, discussions and explanations, monitoring, witnessing, inspections, checks, flight and ground tests and inspection of completed products, parts or appliances produced under CAR 21, Subpart F.
The arrangements should enable the organisation to give positive assistance to DGCA and co-operate in performing the investigation during both initial assessment before issue of letter of agreement and for the subsequent surveillance.

**GM 21.127Approved production ground and flight tests**

The production ground and flight tests for new aircraft will be specified by the aircraft design organisation.

**GM No. 1 to 21.128Acceptable functional test - Engines**

The functional test required for a new engine will be specified by the engine design organisation and will normally include at least the following:

1. Break-in runs that include a determination of fuel and oil consumption and a determination of power characteristics at rated maximum continuous power or thrust and, if applicable, at rated takeoff power or thrust.

2. A period of operation at rated maximum continuous power or thrust is to be determined. For engines having a rated takeoff power or - thrust, part of that period should be at rated takeoff power or - thrust.

The test equipment used for the test run should be capable of output determination of accuracy sufficient to assure that the engine output delivered complies with the specified rating and operation limitations.

**GM No. 2 to 21.128Acceptable functional test –Variable pitch propellers**

The functional tests required for a new propeller will be specified by the propeller design organisation and should normally include a number of complete cycles of

control throughout the propeller pitch and rotational speed ranges. In addition, for feathering and/or reversing propellers, several cycles of feathering operation and

reversing operation from the lowest normal pitch to the maximum reverse pitch, should normally be required.

**GM No. 3 to 21.128Acceptable functional test - Engines and Propellers**

After functional test, each engine or propeller should be inspected to determine that the engine or propeller is in condition for safe operation. Such inspection will be specified by the design organisation and should normally include internal inspection and examination. The degree of internal inspections will normally be determined on the basis of the positive results of previous inspections conducted on the first production engines, and on the basis of service experience.

**GM 21.129(a) Availability for inspection by DGCA**

Each product, part, or appliance should be made available for inspection at any time at the request of DGCA.

It is recommended that a pre-defined plan of inspection points be established and agreed with DGCA to be used as a basis for such inspections.

The manufacturer should provide such documentation, tools, personnel, access equipment etc. as necessary to enable DGCA to perform the inspections.

**AMC No. 1 to 21.129(c) Obligations of the manufacturer – Conformity of prototype models and test specimens**

CAR 21.33 requires determination of conformity of prototype models and test specimens to the applicable design data. For a complete aircraft a 'conformity document', that has to be validated by person authorized by DGCA, should be provided as part of the assistance to the design approval applicant. For products other than a complete aircraft, and for parts and appliances, Form CA-1 validated by DGCA-approved authorised signatory may be used as a conformity document as part of the assistance to the design approval applicant.

**AMC No. 2 to 21.129(c) Obligations of the manufacturer – Conformity with Applicable Design Data**

Individual configurations are often based on the needs of the customer and improvements or changes, which may be introduced by the type-certificate holder. There are also likely unintentional divergences (concessions or non-conformances) during the manufacturing process. All these changes are required to be approved by the design approval applicant / holder, or when necessary by DGCA.

**AMC No. 3 to 21.129(c) Obligations of the manufacturer – Condition for safe operation**

Before issue of the Statement of Conformity, the manufacturer under this Subpart, should make an investigation so as to be satisfied in respect to each of the items listed below. The documented results of this investigation should be kept on file by the manufacturer. The validated Statement of Conformity by DGCA-approved authorized signatory may be required to be provided (or made available) to the operator or owner of the aircraft and to DGCA.

1. Equipment or modifications which do not meet the requirements of the state of manufacture, but have been accepted by the competent authority of the importing country.

2. Identification of products, parts or appliances which:

   2.1 Are not new

   2.2 Are furnished by the buyer or future operator (including those identified in CAR 21.801 and 805).

3. Technical records which identify the location and serial numbers of components, that have traceability requirements for continued airworthiness purposes including those identified in CAR 21.801 and CAR 21.805.

4. Log book and a modification record book for the aircraft as required by DGCA.

5. Log books for products identified in CAR 21.801 installed as part of the type design as required by DGCA.

6. A weight and balance report for the complete aircraft.

7. A record of missing items or defects which do not affect airworthiness, these are for example, could be furnishing or BFE (Items may be recorded in a technical log or other suitable arrangement such that, the operator and DGCA are formally aware).

8. Product support information required by other associated rules / CAR and CS/ FAR or GM, such as a Maintenance Manual, a Parts Catalogue, or MMEL, all of which are to reflect the actual production standard of the particular aircraft. Also, an electrical load analysis and a wiring diagram are to be investigated.

9. Records which demonstrate completion of maintenance tasks appropriate to the test flight flying hours recorded by the aircraft. These records should show the relationship of the maintenance status of the particular aircraft to the manufacturers recommended maintenance task list and the Maintenance Review Board (MRB) document/report.

10. Details of the serviceability state of the aircraft in respect of, a) the fuel and oil contents, b) provision of operationally required emergency equipment such as, life rafts, etc.

11. Details of the approved interior configuration if different from that approved as part of the type design.

12. An approved Flight Manual which conforms to the production standard and modification state of the particular aircraft should be available.

13. Show that inspections for foreign objects at all appropriate stages of manufacture, have been satisfactorily performed.

14. The registration has been marked on the exterior of the aircraft as required by national legislation. Where required by national legislation, fix a fireproof owners nameplate.

15. Where applicable, there should be a certificate for noise and, for the aircraft radio station.

16. The installed compass and or compass systems have been adjusted and compensated and a deviation card displayed in the aircraft.

17. Software criticality list.

18. A record of rigging and control surface movement measurements.

19. Details of installations which will be removed before starting commercial air transport operations (e.g., ferry kits for fuel, radio or navigation).

20. List of all applicable Service Bulletins and Airworthiness Directives that have been implemented.

**AMC No. 1 to 21.130(b) Statement of Conformity for Complete Aircraft**

**1. PURPOSE AND SCOPE**

The description under this AMC refers only to the use of the aircraft Statement of Conformity issued under CAR 21, Subpart F. Statement of Conformity under CAR 21, Subpart F, for products other than complete aircraft, and for parts and appliances is described in AMC No. 2 to 21.130(b).

Use of the aircraft Statement of Conformity issued by an approved production organization, is described in 21.163(b) under CAR 21, Subpart G and the completion instructions are to be found in the appendices to CAR 21.

The purpose of the aircraft, the Statement of Conformity (Form CA-52) issued under CAR 21, Subpart F and validated DGCA-approved authorised signatory is to present a complete aircraft to the DGCA.

DGCA-approved authorised signatory only validates the Statement of Conformity, as described in CAR 21.130 and its associated GM, if it finds that the aircraft conforms with the type design and is in condition for safe operation.

## 2. GENERAL

The Statement
of Conformity must comply with the format attached including block numbers and the location of each Block. The size of each Block may however be varied to suit the individual application, but not to the extent that would make the Statement of Conformity un-recognisable. For any doubt, DGCA may be consulted.

The Statement of Conformity must either be pre-printed or computer generated, but in either case the printing of lines and characters must be clear and legible. Pre-printed wording is permitted in accordance with the attached model but no other certification statements are permitted.

Statements of Conformity must be issued in English. Completion may be either machine/computer printed or hand-written using block letters to permit easy reading.

A copy of the validated Statement of Conformity with all referenced attachments are to be retained by the manufacturer and copy of the validated Statement of Conformity with all referenced attachments should be forwarded to DGCA.

## 3. COMPLETION OF THE AIRCRAFT STATEMENT OF CONFORMITY BY THE ORIGINATOR

There must be an entry in all Blocks to make the document a valid Statement.

A Statement of Conformity must not be issued for validation to DGCA-approved authorized signatory, unless the design of the aircraft and its installed products are approved.

The information required in Blocks 9, 10, 11, 12, 13 and 14 may be by reference to separate identified documents held on file by the manufacturer, unless DGCA agrees otherwise.

This Statement of Conformity is not intended to provide approval for the complete equipment required by the applicable operational rules. However, some of these individual items may be included in Block 10 or in the approved type design. Operators are therefore reminded of their responsibility to ensure compliance with the applicable operational rules for their own particular operation.

Block 1 Enter name of the State of manufacture.

Block 2 The Competent Authority under which authority the Statement of Conformity is issued.

Block 3 A unique serial number should be pre-printed in this block for Statement control and traceability purposes. Except that in the case of a computer generated document the number need not be pre-printed where the computer is programmed to produce and print a unique number.

Block 4 The full name and location address of the manufacturer issuing the statement. This Block may be pre-printed. Logos, etc., are permitted, if the logo can be contained within the block.

Block 5 The aircraft type in full as defined in the type-certificate and its associated data sheet.

Block 6 The type-certificate reference number and issue for the subject aircraft.

Block 7 If the aircraft is registered then this mark will be the registration mark. If the aircraft is not registered then this will be such a mark that is accepted by DGCA and, if applicable, by the competent authority of a third country.

Block 8 The identification number assigned by the manufacturer for control and traceability and product support. This is sometimes referred to as a Manufacturers Serial No. or Constructors No.

Block 9 The engine and propeller type(s) in full as defined in the relevant type-certificate and its associated data sheet. Their manufacturer identification No and associated location should also be shown.

Block 10 Approved design changes to the Aircraft Definition.

Block 11 A listing of all applicable airworthiness directives (or equivalent) and a declaration of compliance, together with a description of the method of compliance on the subject individual aircraft including products and installed parts, appliances and equipment. Any future compliance requirement time should be shown.

Block 12 Approved unintentional deviation to the approved type design sometimes referred to as concessions, divergences, or non-conformances.

Block 13 Only agreed exemptions, waivers or derogations may be included here.

Block 14 Remarks: Any statement, information, particular data or limitation which may affect the airworthiness of the aircraft. If there is no such information or data, state; 'NONE'.

Block 15 Enter 'Certificate of Airworthiness' or 'Special Certificate of Airworthiness' for the Certificate of Airworthiness requested.

Block 16 Additional Requirements such as those notified by an importing country should be noted in this block.

Block 17 Validity of the Statement of Conformity by the DGCA-approved Authorised signatory is dependent on full completion of all Blocks on the form. A copy of the flight test report together with any recorded defects and rectification details, should be kept on file by the manufacturer. The report should be signed as satisfactory by the appropriate certifying staff and a flight crew member, e.g., test pilot or flight test engineer. The flight tests performed are those required by CAR 21.127 and GM 21.127, to ensure that the aircraft is airworthy.

The listing of items provided (or made available) to satisfy the safe operation aspects of this statement should be kept on file by the manufacturer.

Block 18 The Statement of Conformity may be signed by the person authorised to do so by the manufacturer in accordance with CAR 21.130(a). A rubber stamp signature should not be used.

Block 19 The name of the person signing the certificate should be typed or printed in a legible form.

Block 20 The date the Statement of Conformity is signed must be given.

Block 21 For production under CAR 21, Subpart F, state "N/A"

Additionally, for production under CAR 21 Subpart F, this block must include validation by DGCA-approved Authorised signatory. For this purpose, the validation statement below should be included in the Block 21 itself, and not referred in a separate document. The statement can be pre-printed, computer generated or stamped, and should be followed by the signature of the DGCA-approved Authorised signatory validating the certificate, the name and the position/identification of such DGCA-approved Authorised signatory, and the date of such validation.

**VALIDATION STATEMENT:**

"After due inspection, the undersigned is satisfied that this document constitutes an accurate and valid Statement of Conformity in accordance with CAR 21, Subpart F."

**AMC No. 2 to 21.130(b)Statement of Conformity for Products (other than complete aircraft), parts and/or appliances – The Authorised Release Certificate (Form CA 1)**

**A. INTRODUCTION**

This AMC relates specifically to the use of the Form CA-1 for manufacturing purposes under CAR-21 Subpart F. It can be used as a supplement to the completion instructions in CAR -21, which covers the use of the FORM CA-1.

**1. PURPOSE AND USE**

The FORM CA-1 is prepared and signed by the manufacturer. For production under CAR -21 Subpart Fit is presented for validation by the competent authority.

Under Subpart F the Certificate may only be issued by the competent authority.

A mixture of items released under Subpart G and under Subpart F of CAR-21 is not permitted on the same certificate.

**2. GENERAL FORMAT**

Refer to Form Section of this CAR

**3. COPIES**

Refer to instruction with Form CA 1 in Form Section of this CAR

The CAR-21 Subpart F originator must retain a copy of the certificate in a form that allows verification of original data.

**4. ERROR(S) ON THE CERTIFICATE**

If an end user finds an error(s) on a certificate, they must identify it/them in writing to the originator. The originator may prepare and sign a new certificate for validation by the DGCA if they can verify and correct the error(s).

The new certificate must have a new tracking number, signature and date.

The request for a new certificate may be honoured without re-verification of the item(s) condition. The new certificate is not a statement of current condition and should refer to the previous certificate in block 12 by the following statement: 'This certificate corrects the error(s) in block(s) [enter block(s) corrected] of the certificate [enter original tracking number] dated [enter original issuance date] and does not cover conformity/condition/release to service.' Both certificates should be retained according to the retention period associated with the first.

## 5. COMPLETION OF THE CERTIFICATE BY THE ORIGINATOR

Refer to instruction with Form CA 1 in Form Section of this CAR for completion of the certificate.

Block 12 – Remarks

Examples of conditions which would necessitate statements in block 12 are:
□When the certificate is used for prototype purposes, the following statement must be entered at the beginning of block 12:

'NOT ELIGIBLE FOR INSTALLATION ON IN-SERVICE TYPE-CERTIFICATED AIRCRAFT'.
□Re-certification of items from 'prototype' (conformity only to non-approved data) to 'new' (conformity to approved data and in a condition for safe operation) once the applicable design data is approved.

The following statement must be entered in block 12:

RE-CERTIFICATION OF ITEMS FROM 'PROTOTYPE' TO 'NEW':

THIS DOCUMENT CERTIFIES THE APPROVAL OF THE DESIGN DATA [INSERT TC/STC NUMBER, REVISION LEVEL], DATED [INSERT DATE IF NECESSARY FOR IDENTIFICATION OF REVISION STATUS], TO WHICH THIS ITEM (THESE ITEMS) WAS (WERE) MANUFACTURED.

□When a new certificate is issued to correct error(s), the following statement must be entered in block 12:

'THIS CERTIFICATE CORRECTS THE ERROR(S) IN BLOCK(S) [ENTER BLOCK(S) CORRECTED] OF THE CERTIFICATE [ENTER ORIGINAL TRACKING NUMBER] DATED [ENTER ORIGINAL ISSUANCE DATE] AND DOES NOT COVER CONFORMITY/CONDITION/RELEASE TO SERVICE'.

Additionally, for production under Subpart F, this block must include the Statement of Conformity by the manufacturer under 21.130. For this purpose, the appropriate Block 13a statement must be included in the block 12 and not referenced in a separate document. The statement may be pre-printed, computer generated or stamped, and must be followed by the signature of the manufacturer's authorised person under 21.130 (a), the name and the position/identification of such person and the date of the signature.

In case of an engine, when the Competent Authority has granted an emissions production cut-off exemption the following statement must be entered in block 12:

'["NEW" OR "SPARE"] ENGINE EXEMPTED FROM NOx EMISSIONS PRODUCTION CUT-OFF REQUIREMENT

Block 13b – Authorised Signature

This space shall be completed with the signature of the DGCA representative validating the block 12 manufacturer Statement of Conformity, under 21.130 (d). To aid recognition, a unique number identifying the representative may be added.

Block 13c – Approval/Authorisation Number

Enter the authorisation number reference. This number or reference is given by the DGCA to the manufacturer working under CAR -21 Subpart F.

**GM 21A.130 (b) (4) Definitions of engine type certification date and production date**

Volume II of Annex 16 to the Chicago Convention contains two different references to applicability dates:

- 'Date of manufacture for the first individual production model' which refers to the engine type certification date; and
- 'Date of manufacture for the individual engine' which refers to the production date of a specific engine serial number (date of Form CA 1)
- The second reference is used in the application of the engine NOx emissions production cut-off requirement, which specifies a date after which all in-production engine models must meet a certain NOx emissions standard.

21.130(b)(4) includes the production requirements and refers to paragraphs (b) and (d) of Volume II, Part III, Chapter 2, paragraph 2.3 of Annex 16 to the Chicago Convention.

**AMC 21.130 (b) (4) Applicable emissions requirements**

1. General

This determination is made according to the data provided by the engine type certificate holder. This data should allow the determination of whether the engine complies with the emissions production cut-off requirement of paragraph (d) of Volume II, Part III, Chapter 2, paragraph 2.3.2 of Annex 16 to the Chicago Convention. It should be noted that in the case of engines for which the Competent Authority has granted an exemption from these requirements, the emissions requirements applicable are the regulatory levels defined in Volume II, Part III, Chapter 2, paragraph 2.3.2 c) of Annex 16 to the Chicago Convention.

2. Process and criteria for exemptions against a NOx emissions production cut-off requirement

2.1 Request

The organisation should submit a formal request to the DGCA, signed by an appropriate manager, and copied to all other relevant organisations and involved. The letter should include the following information for the DGCA to be in a position to review the application:

- Administration
- Name, address and contact details of the organisation.
- b) Scope of the request
- Engine type (model designation, type-certificate (TC) number, TC date, emission TC basis, ICAO Engine Emissions Databank Unique Identification (UID) Number);
- Number of individual engine exemptions requested;
- Duration (end date) of continued production of the affected engines.
- Whether the proposed affected engines are 'spares' or 'new' and whom the engines will be originally delivered to.

Note: In the case where the engines are 'new' (new engines installed on new aircraft), and if this would result in a larger negative environmental impact as compared to exemptions only for spare engines, more detailed justification could be required to approve this application

c) Justification for exemptions

When requesting an exemption for a 'new' engine, the organisation should, to the extent possible, address the following factors, with quantification, in order to support the merits of the exemption request:

- Technical issues, from an environmental and airworthiness perspective, which may have delayed compliance with the production cut-off requirement;
- Economic impacts on the manufacturer, operator(s) and aviation industry at large;
- Environmental effects. This should consider the amount of additional NOx emissions that will be emitted as a result of the exemption. This could include consideration of items such as:

— the amount that the engine model exceeds the NOx emissions standard, taking into account any other engine models in the engine family covered by the same type-certificate and their relation to the standard;

— the amount of NOx emissions that would be emitted by an alternative engine for the same application; and

— the impact of changes to reduce NOx on other environmental factors, including community noise and CO2 emissions;

- Impact of unforeseen circumstances and hardship due to business circumstances beyond the manufacturer's control (e.g. employee strike, supplier disruption or calamitous events);

- Projected future production volumes and plans for producing a compliant version of the engine model seeking exemption;

- Equity issues in administering the production cut-off among economically competing parties (e.g. provide rationale for granting this exemption when another manufacturer has a compliant engine and does not need an exemption, taking into account the implications for operator fleet composition, commonality and related issues in the absence of the engine for which exemptions are sought);

- Any other relevant factors.

2.2 Evaluation

2.2.1. DGCA process the request in consultation with third Countries involved by contacting the relevant Design Organisation. DGCA advises the Competent Authority concerned during the process of granting exemptions. The advice from the DGCA should take the form of a letter sent to the Competent Authority.

2.2.2 The evaluation of an exemption request should be based on the justification provided by the organisation and on the following definitions and criteria:

a) Use of engines

'Spare engines' are defined as complete new engine units which are to be installed on in-service aircraft for maintenance and replacement. It can be presumed that exemption applications associated with engines for this purpose would be granted as long as the emissions were equal to or lower than those engines they are replacing. The application should include the other items described in points (a) and (b) of paragraph 2.1 above, but it would not need to include the items specified in point (c). For spare engines, the evaluation of the exemption application would be conducted for record keeping and reporting purposes, but it would not be done for approval of an exemption.

'New engines' are defined as complete new engine units which are to be installed on new aircraft. They can only be exempted from a NOx production cut-off requirement

if they already meet the previous standard (e.g. exemption from the CAEP/6 NOx production cut-off requirement of paragraph (d) of Volume II, Part III, Chapter 2, paragraph 2.3.2 of Annex 16 to the Chicago Convention is only possible if an engine type already meets the regulatory levels defined in Volume II, Part III, Chapter 2, paragraph 2.3.2 c) of Annex 16 to the Chicago Convention). Also, in order for an exemption to be granted for this type of engine the applicant must clearly demonstrate that they meet the criteria for an exemption by including items described in points (a), (b) and (c) of paragraph 2.1 above. DGCA may require additional information regarding the appropriateness of the potential exemption.

b) Number of new engine exemptions should be based on a total number of engines and time period for delivery of these engines, which would be agreed at the time the application is approved and based on the considerations explained in point (c) of paragraph 2.1 above. The number of engines exempted should not exceed 75 per engine type-certificate, and the end date of continued production of the affected engines should not exceed 31.12.2016. The number of exemptions is related to individual non-compliant engines covered under the same type-certificate.

Exemptions for new engines should be processed and approved by the DGCA, for both the manufacture of the exempted engines and the initial operator of the aircraft to which they are to be fitted. Given the international nature of aviation , the DGCA should attempt to collaborate and consult on the details of exemptions. In the case where engine type certification is done through a reciprocity agreement between the Third Countries, the DGCA should coordinate on the processing of exemptions and concur before approval is granted.

c) Other engines

Unlimited exemptions may be granted for continued production of spare engines having emissions equivalent to or lower than the engines they are replacing.

Engines for use on aircraft excluded from the scope of the Basic Regulation (e.g. military, customs, police, search and rescue, fire fighting, coastguard or similar activities or services) - are excluded from civil aircraft NOx production cut-off requirements.

2.3 Rejection of request

If the DGCA rejects the request for exemption, the response should include a detailed justification.

**AMC 21.130(c)Validation of the Statement of Conformity**

It is the responsibility of the applicant to ensure that each and every product, part and appliance is airworthy before issuing and signing the relevant Statement of Conformity. During manufacture, the applicant is expected to use such facilities

systems, processes and procedures as are described in the manual and have been previously agreed with DGCA.

DGCA must then make such inspection and investigation of records and product, part or appliance as are necessary to determine that the agreed facilities, systems, processes and procedures have been used, and that the Statement of Conformity may be regarded as a valid document.

To enable timely inspection and investigation by DGCA, the Statement of Conformity must be prepared, validated and submitted to DGCA immediately upon satisfactory completion of final production inspection and test.

**AMC 21.130(c)(1)Initial transfer of ownership**

Upon transfer of ownership:

a) For a complete aircraft, whether or not an application for a Certificate of Airworthiness is to be made, Form CA-52 must be completed and submitted to DGCA after validation by DGCA-approved authorized signatory.

b) For anything other than a complete aircraft, Form CA-52 is inappropriate, and Form CA-1must be completed and submitted to DGCA after validation by DGCA-approved authorized signatory.

**NOTE:** If there is any significant delay between the last production task and submission of Form CA-52 or Form CA-1 to DGCA, then additional evidence relating to the storage, preservation and maintenance of the item since its production must be presented to DGCA.

# Subpart G – Production organisation approval for products, parts and appliances

**GM 21.131 Scope – Applicable design data**

Applicable design data is defined as all necessary drawings, specifications and other technical information provided by the holder of a design organisation approval, TC, STC, approval of repair or minor change design, or ITSO authorisation (or equivalent when CAR 21, Subpart G is used for production of products, parts or appliances, the design of which has been approved other than according to CAR 21) and released in a controlled manner to a production organisation approval holder. This should be sufficient for the development of production data to enable repeatable manufacture to take place in conformity with the design data.

Prior to issue of the TC, STC, approval of repair or minor change design or ITSO authorisation, or equivalent, design data is defined as 'not approved' but parts and appliances may be released with a Form CA-1 as a certificate of conformity.

After issue of the TC, STC, approval of repair or minor change or ITSO authorisation, or equivalent, this design data is defined as 'approved' and items manufactured in conformity are eligible for release on a Form CA-1 for airworthiness purposes.

For the purpose of Subpart G of CAR 21 the term 'applicable design data 'includes, in case of engines and when applicable, the information related to the applicable emissions production cut-off requirement

**GM 21.133(a)Eligibility – Approval appropriate for showing conformity**

'Appropriate' should be understood as follows:

- The applicant produces or intends to produce aeronautical products, parts, appliances and/or materials intended for airborne use as part of a type-certificated product (this excludes simulators, ground equipment and tools).

- The applicant will be required to show a need for an approval, normally based on one or more of the following criteria:

    1. Production of aircraft, engines or propellers (except if DGCA considers a POA inappropriate)
    2. Production of ITSO articles and parts marked IPA
    3. Direct delivery to users such as owners or operators maintenance organisations with the need for exercising the privileges of issuing Authorized Release Certificates – Form CA-1
    4. Participation in an international co-operation program where working under an approval is considered necessary by DGCA

5. Criticality and technology involved in the part, appliance, or material being manufactured. Approval in this case may be found by DGCA as the best tool to exercise its duty in relation to airworthiness control
6. Where an approval is otherwise determined by DGCA as being required to satisfy the essential requirements of this regulation.

- It is not the intent of DGCA to issue approvals to manufacturing firms that perform only sub-contract work for main manufacturers of products and are consequently placed under their direct surveillance.

- Where standard parts, materials, processes or services are included in the applicable design data (see guidance on applicable design data in GM 21.131) their standards should be controlled by the POA holder in a manner which is satisfactory for the final use of the item on the product, part or appliance. Accordingly, the manufacturer or provider of the following will not at present be considered for production organisation approval:

  - Consumable materials
  - raw materials
  - Standard parts
  - Parts identified in the product support documentation as 'industry supply' or 'no hazard'
  - Non-destructive testing or inspection
  - Processes (heat treatment, surface finishing, shot peening, etc.

**AMC No. 1 to 21.133(b) and (c)Eligibility – Link between design and production organizations**

An arrangement is considered appropriate if it is documented and satisfies DGCA that co-ordination is satisfactory.

To achieve satisfactory coordination the documented arrangements must at least define the following aspects irrespective of whether the two organisations are separate legal entities or not:

- The responsibilities of a design organisation which assure correct and timely transfer of upto-date airworthiness data (e.g., drawings, material specifications, dimensional data, processes, surface treatments, shipping conditions, quality requirements, etc.);

- The responsibilities and procedures of a POA holder/applicant for developing, where
  applicable, its own manufacturing data in compliance with the airworthiness data package;

- The responsibilities of a POA holder/applicant to assist the design organisation in dealing with continuing airworthiness matters and for required actions (e.g., traceability of parts in case of direct delivery to users, retrofitting of modifications, traceability of processes' outputs and approved deviations for individual parts as applicable, technical information and assistance, etc.);

- The scope of the arrangements must cover CAR 21 Subpart G requirements and associated AMC and GM, in particular: 21.145(b), 21.165(c), (f) and (g);

- The responsibilities of a POA holder/applicant, in case of products prior to type certification to assist a design organisation in showing compliance with CS/FAR (access and suitability of production and test facilities for manufacturing and testing of prototype models and test specimen);

- The procedures to deal adequately with production deviations and non conforming parts;

- The procedures and associated responsibilities to achieve adequate configuration control of manufactured parts, to enable the production organisation to make the final determination and identification for conformity or airworthiness release and eligibility status;

- The identification of the responsible persons/offices who control the above;

- The acknowledgment by the holder of the TC/STC/repair or change approval/ITSO authorisation that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved.

In many cases the production organisation may receive the approved design data through an intermediate production organisation. This is acceptable provided an effective link between the design approval holder and the production organisation can be maintained to satisfy the intent of 21.133.

When the design and production organisations are two separate legal entities a Direct Delivery Authorisation must be available for direct delivery to end users in order to guarantee continued airworthiness control of the released parts and appliances.

Where there is no general agreement for Direct Delivery Authorisation, specific permissions may be granted (refer to AMC 21.4).

**AMC No. 2 to 21.133(b) and (c) Eligibility – Link between design and production organisations**

In accordance with AMC No.1 to 21.133(b) and (c), the POA holder must demonstrate to DGCA that it has entered into an arrangement with the design organisation. The arrangement must be documented irrespective of whether the two organisations are separate legal entities or not.

The documented arrangement must facilitate the POA holder to demonstrate compliance with the requirement of 21.133(b) and (c) by means of written documents agreed.

In the case where the design organisation and POA holder are part of the same legal entity, these interfaces may be demonstrated by company procedures accepted by DGCA.

In all other cases to define such a design/production interface the following sample format is offered:

**Arrangement Sample Form**

| **ARRANGEMENT**<br>In accordance with 21.133(b) and (c) | |
|---|---|
| The undersigned agree on the following commitments: | relevant interface procedures |
| The design organisation [NAME] takes responsibility to<br><br>➢ assure correct and timely transfer of up-to-date applicable design data (e.g., drawings, material specifications, dimensional data, processes, surface treatments, shipping conditions, quality requirements, etc.) to the production organisation approval holder [NAME]<br><br>➢ provide visible statement(s) of approved design data | |
| The production organisation approval holder [NAME] takes responsibility to<br><br>• assist the design organisation [Name] in dealing with continuing airworthiness matter and for required actions<br><br>• develop, where applicable, its own manufacturing data in compliance with the airworthiness data package | |
| The design organisation [Name] and the POA holder [Name] take joint responsibility to<br><br>• deal adequately with production deviations and non conforming parts in accordance with the applicable procedures of the design organisation and the production organisation approval holder<br><br>• achieve adequate configuration control of manufactured parts, to enable the POA holder to make the final determination and identification for conformity. | |

| | |
|---|---|
| | |
| The scope of production covered by this arrangement is detailed in [DOCUMENT REFERENCE/ ATTACHED LIST] | |
| [When the design organisation is not the same legal entity as the production organisation approval holder ]<br><br>Transfer of approved design data<br>The TC/STC/ITSO holder [NAME] acknowledges that the approved design data provided, controlled and modified in accordance with the arrangement are recognised as approved by the DGCA and therefore the parts and appliances manufactured in accordance with these data and found in a condition for safe operation may be released certifying that the item was manufactured in conformity to approved design data and is in a condition for safe operation. | |
| [When the design organisation is not the same legal entity as the production organisation approval holder]<br>Direct Delivery Authorisation<br>This acknowledgment includes also [OR does not include] the general agreement for direct delivery to end users in order to guarantee continued airworthiness control of the released parts and appliances. | |
| for the [NAME of the design organisation/DOA holder]<br><br>date signature<br>xx.xx.xxxx<br>([NAME in block letters]) | for the [NAME of the POA holder]<br><br>date signature<br>xx.xx.xxxx<br>([NAME in block letters]) |

**Instructions for completion:**

**Title:** The title of the relevant document must clearly indicate that it serves the purpose of a design/production interface arrangement in accordance with 21.133(b) and (c).

**Commitment**: The document must include the basic commitments between the design organization and the POA holder as addressed in AMC 21.4 and AMC No. 1 to 21.133(b) and (c).

**Relevant Procedures:** Identify an entry point into the documentary system of the organisations with respect to the implementation of the arrangement (for example a contract, quality plan, handbooks, common applicable procedures, working plans etc.).

**Scope of arrangement:** The scope of arrangement must state by means of a list or reference to relevant documents those products, parts or appliances that are covered by the arrangement.

**Transfer of applicable design data**: Identify the relevant procedures for the transfer of the applicable design data required by 21.131 and GM 21.131from the design organisation to the POA holder. The means by which the design organisation advises the POA holder whether such data is approved or not approved must also be identified (ref. 21.4/AMC 21.4).

**Direct Delivery Authorisation**: Where the design organisation and the POA holder are separate legal entities, the arrangement must clearly identify whether authorisation for direct delivery to end users is permitted or not.

Where any intermediate production/design organisations are involved in the chain between the original design organisation and the POA holder, evidence must be available that this intermediate organisation has received authority from the design organisation to grant Direct Delivery Authorisation.

**Signature:** AMC No. 1 to 21.133(b) and (c) requests the identification of the responsible persons/offices who control the commitments laid down in the arrangement. Therefore the basic document must be signed mutually by the authorised representatives of the design organisation and the POA holder in this regard.

**GM 21.133 (d) Eligibility**

Intent of clause 21.133(d) is to facilitate aircraft manufacturer's not having valid licence agreement with the current Type Certificate holders but having design data obtained through a licence agreement in the past, to manufacture the aircraft and its components.

**AMC 21.133 (d) Eligibility**

Manufacturers of replacement parts may establish that they have required design data and are being managed by appropriately approved design organization. Further, establish that the design data was obtained through proper licence agreement with the principle Type Certificate holder and are in a position to assure continued airworthiness of the aircraft and parts manufactured by them.

The prospective aircraft and parts manufacturer may provide a copy of the licence agreement as evidence to the DGCA.

**GM 21.134Application – Application form and manner**

Form CA-50 should be obtained from DGCA, and completed by the accountable manager of the organisation.

The completed form, an outline of the production organisation exposition, and details of the proposed terms of approval are to be forwarded to DGCA.

**GM No. 1 to 21.139(a)Quality System**

The quality system is an organisational structure with responsibilities, procedures, processes, and resources which implement a management function to determine and enforce quality principles.

The quality system should be documented in such a way that the documentation can be made easily available to personnel who need to use the material for performing their normal duties, in particular:

- procedures, instructions, data to cover the issues of 21.139(b)(1) are available in a written form,
- distribution of relevant procedures to offices/persons is made in a controlled manner,
- procedures which identify persons responsible for the prescribed actions are established,
- the updating process is clearly described.

The manager responsible for ensuring that the quality system is implemented and maintained, should be identified.

DGCA will verify on the basis of the exposition and by appropriate investigations that the production organisation has established and can maintain their documented quality system.

**GM No. 2 to 21.139(a)Quality System – Conformity of supplied parts or appliances**

The POA holder is responsible for determining and applying acceptance standards for physical condition, configuration status and conformity of supplied products, parts or appliances, whether to be used in production or delivered to customers as spare parts. This responsibility also includes BFE (Buyer Furnished Equipment) item.

To discharge this responsibility the quality system needs an organisational structure and procedures to adequately control external suppliers. Elements of the quality system for the control of suppliers may be performed by other parties provided that the conditions of AMC No. 1 or No. 2 to 21.139(b)(1)(ii) are met.

Control can be based upon use of the following techniques (as appropriate to the system or product orientation necessary to ensure conformity):

- Qualification and auditing of supplier's quality system
- Evaluation of supplier capability in performing all manufacturing activities, inspections and tests necessary to establish conformity of parts or appliances to type design
- First article inspection, including destruction if necessary, to verify that the article conforms to the applicable data for new production line or new supplier
- Incoming inspections and tests of supplied parts or appliances that can be satisfactorily inspected on receipt
- Identification of incoming documentation and data relevant to the showing of conformity to be included in the certification documents
- A vendor rating system which gives confidence in the performance and reliability of this supplier
- Any additional work, tests or inspection which may be needed for parts or appliances which are to be delivered as spare parts and which are not subjected to the checks normally provided by subsequent production or inspection stages.

The POA holder may rely on inspection/tests performed by supplier if it can establish that:

- Personnel responsible in charge of these tasks satisfy the competency standards of the POA quality system
- Quality measurements are clearly identified
- the records or reports showing evidence of conformity are available for review and audit.

The control of suppliers holding a POA for the parts or appliances to be supplied can be reduced, to a level at which a satisfactory interface between the two quality systems can be demonstrated. Thus, for the purpose of showing conformity, a POA holder can rely upon documentation for parts or appliances released under a suppliers 21.163 privileges.

A supplier who does not hold a POA is considered as a sub-contractor under the direct control of the POA quality system.

The POA holder retains direct responsibility for inspections/tests carried out either at its own facilities or at supplier's facilities.

**GM 21.139(b)(1)Quality System – Elements of the quality system**

1. The control procedures covering the elements of 21.139(b)(1) should document the standards to which the production organisation intends to work.

2. An organisation having a Quality system designed to meet a recognised Standard such as ISO 9002 (relevant to the scope of approval being requested) should expand it to include at least the following additional topics, as appropriate, in order to show compliance with the requirements of CAR 21, Subpart G:

   - Mandatory Occurrence Reporting and continued airworthiness as required by 21.165(e)

   - Control of work occasionally performed (outside the POA facility by POA personnel)

   - Co-ordination with the holder of an approved design as required by 21.133(b) and (c) and 21.165(g)

   - Issue of certifications within the scope of approval for the privileges of 21.163

   - Incorporation of airworthiness data in production and inspection data as required in 21.133(b) and (c)and 21.145(b)

   - When applicable, ground test and/or production flight test of products in accordance with procedures defined by the holder of, the design approval

   - Procedures for traceability including a definition of clear criteria of which items need such traceability. Traceability is defined as a means of establishing the origin of an article by reference to historical records for the purpose of providing evidence of conformity

   - Personnel training and qualification procedures especially for certifying staff as required in 21.145(d).

3. An organization having a quality system designed to meet a recognized aerospace quality standard will still need to ensure compliance with all the requirements of Subpart G of CAR 21. In all cases, DGCA will still need to be satisfied that compliance with CAR 21 Subpart G is established.

**AMC No. 1 to 21.139(b)(1)(ii) Vendor and sub-contractor assessment, audit and control – Production Organisation Approval (POA) holder using documented arrangements with other parties for assessment and surveillance of a supplier.**

1 General

Note

For the purpose of this AMC, vendors and sub-contractors are hereafter referred to as "suppliers", regardless of whether or not they hold a POA and audit and control is hereafter referred to as "surveillance".

The production organisation is required by CAR-21 to demonstrate that it has established and maintains a quality system that enables the organisation to ensure that each item produced conforms to the applicable design data and is in a condition for safe operation. To discharge this responsibility, the quality system should have, among other requirements, procedures to adequately carry out the assessment and surveillance of suppliers.
The use of Other Parties (OP), such as a consulting firm or quality assurance company, for supplier assessment and surveillance does not exempt the POA holder from its obligations under 21.165. The supplier assessment and surveillance, corrective action and follow-up activity conducted at any of its supplier's facilities may be performed by OP.

The purpose of using an OP cannot be to replace the assessment, audit and control of the POA Holder. It is to allow an element (i.e. the assessment of the quality system) to be delegated to another organisation under controlled conditions.

The use of OP to perform supplier assessments and surveillance should be part of the production organisation quality system and fulfil the conditions of this AMC.

This AMC is applicable to a method whereby a POA holder has a documented arrangement with OP for the purpose of assessing and/or surveying a POA's supplier.

2 Approval by the DGCA

Implementing or changing procedures for using OP for supplier assessment and surveillance is a significant change to the quality system and requires approval in accordance with 21.147.

3 Conditions and criteria for the use of OP to perform supplier assessment and surveillance.

(a) The POA holder should include the use of OP for supplier assessment and surveillance in the POA holders' quality system to demonstrate compliance with the applicable requirements of CAR-21.

(b) Procedures required for using OP for supplier assessment and surveillance should be consistent with other procedures of the POA holders' quality system.

(c) Procedures of the POA holder that uses OP to perform supplier assessment and surveillance should include the following:

(1) Identification of the OP that will conduct supplier assessment and surveillance

(2) A listing of suppliers under surveillance by the OP. This listing should be maintained by the POA holder and made available to the DGCA upon request.

(3) The method used by the POA holder to evaluate and monitor the OP. The method should include the following as a minimum:

(i) Verification that standards and checklists used by the OP are acceptable for the applicable scope.

(ii) Verification that the OP is appropriately qualified and have sufficient knowledge, experience and training to perform their allocated tasks.

(iii) Verification that the OP surveillance frequency of the suppliers is commensurate with the complexity of the product and with the surveillance frequency established by the POA holder's suppliers control programme.

(iv) Verification that the suppliers' assessment and surveillance is conducted on-site by the OP.

(v) Verification that the OP has access to applicable proprietary data to the level of detail necessary to survey suppliers functions.

(4) A definition to what scope the OP will conduct suppliers surveillance on behalf of the POA holder. If the OP replaces surveillance in part, the POA holder should identify the functions that will continue to be surveyed by the POA holder.

(5) The procedures used by the OP to notify the POA holder of non conformities discovered at the suppliers facility, corrective action and follow-up.

(d) The POA should make arrangements that allow the DGCA to make investigation in accordance with 21.157 to include OP activities.

**AMC No. 2 to 21.139(b)(1)(ii) Vendor and sub-contractor assessment, audit and control - Production Organisation Approval (POA) holder using other party supplier certification**

1 General

Note

For the purpose of this AMC, vendors and sub-contractors are here after referred to as "suppliers", regardless of whether or not they hold a POA and audit and control is hereafter referred to as "surveillance".

Other party supplier certification is a method whereby a supplier contracts with an appropriately recognised or accredited Other Party (OP) for the purpose of obtaining a certification from that OP. Certification indicates that the supplier has satisfactorily demonstrated to meet the applicable standard on a continuing basis. OP certification results in placing the supplier on the OP list of certified organisations, or in the supplier receiving a certificate identifying the requirements that have been met. Periodic follow-

up evaluations are conducted by the OP to verify continued compliance with the requirements of the applicable standard.

The production organisation is required by CAR -21 to demonstrate that it has established and maintains a quality system that enables the organisation to ensure that each item produced conforms to the applicable design data and is in a condition for safe operation. To discharge this responsibility, the quality system should have, among other requirements, procedures to adequately carry out the assessment and surveillance of suppliers.

The assessment and surveillance of suppliers by an OP should be deemed to satisfy the requirements of 21.139(b)(1)(ii) when the conditions of this AMC are satisfied. The assessment and surveillance of suppliers by OP as part of supplier certification does not exempt the POA holder from its obligations under 21.165. The supplier assessment and surveillance, corrective action and follow-up activity conducted at any of its supplier's facilities may be performed by OP.

The purpose of using an OP cannot be to replace the assessment, audit and control of the POA Holder. It is to allow an element (i.e. the assessment of the quality system) to be delegated to another organisation under controlled conditions.

The use of suppliers that are certified by OP in accordance with this AMC should be part of a production organisation quality system.

2 Approval by the DGCA

Implementing or changing procedures for using suppliers that are certified by an OP is a significant change to the quality system and requires approval in accordance with 21A.147.

3 Conditions and criteria for using supplier certification for the supplier assessment and surveillance.

(a) The POA holder should include the use of supplier certification for the supplier assessment and surveillance in the POA holder's quality system to demonstrate compliance with the applicable requirements of CAR-21.

(b) Procedures required for use of supplier certification for the supplier assessment and surveillance should be consistent with other procedures of the POA holders' quality system.

(c) Procedures of the POA holder that uses supplier certification for the supplier assessment and surveillance should include the following:

(1) Listing of the OP that has certified or will certify suppliers and will conduct supplier assessment and surveillance or the scheme under which the accreditation of the OP is controlled. This listing should be maintained by the POA holder and made available to the DGCA upon request.

(2) A listing of the certified suppliers under surveillance by the OP and used by the POA holder. This listing should be maintained by the POA holder and made available to the DGCA upon request.

(3) The method used by the POA holder to evaluate and monitor the certification process of any OP certification body or OP certification scheme used. This applies not only to new suppliers, but also to any decision by the POA holder to rely on OP certification of current suppliers. The method should include the following as a minimum:

(i) Verification that certification standards and checklists are acceptable and applied to the applicable scope.

(ii) Verification that the OP is appropriately qualified and has sufficient knowledge, experience and training to perform its allocated tasks.

(iii) Verification that the OP surveillance frequency of the suppliers is commensurate with the complexity of the product and with the surveillance frequency established by the POA holder's suppliers control programme.

(iv) Verification that the suppliers' surveillance is conducted on-site by the OP.

(v) Verification that the surveillance report will be made available to the DGCA upon request.

(vi) Verification that the OP continues to be recognised or accredited.

(vii) Verification that the OP has access to applicable proprietary data to the level of detail necessary to survey suppliers functions.

Where the POA holder uses an OP accredited by DGCA and working in accordance with an aviation standard that describes requirements for the OP certification, the items (ii), (iv) and (v) shall be deemed to be complied with.

(4) A definition to what scope the OP will conduct suppliers surveillance on behalf of the POA holder. If the OP replaces surveillance in part, the POA holder should identify the functions that will continue to be surveyed by the POA holder.

(5) Procedures that ensure that the POA is aware of the loss of an existing certification.

(6) Procedures that ensure that the POA holder is aware of nonconformities and has access to detailed information of these non conformities.

(7) Procedures to evaluate the consequences of nonconformities and take appropriate actions.

(d) The POA should make arrangements that allow the DGCA to make investigation in accordance with 21.157 to include OP activities

**GM No. 1 to 21.139(b)(2)Quality System – Independent quality assurance function**

The quality assurance function which is part of the organisation is required to be independent from the functions being monitored. This required independence relates to the lines of reporting, authority and access within the organisation and assumes an ability to work without technical reliance on the monitored functions.

**GM No. 2 to 21.139(b)(2)Quality System – Adequacy of procedures and monitoring function**

Adequacy of procedures means that the quality system, through the use of the procedures as set forth, is capable of meeting the conformity objectives identified in 21.139(a).
The quality assurance function to ensure the above should perform planned continuing and systematic evaluations or audits of factors that affect the conformity (and, where required, safe operation) of the products, parts, and/or appliances to the applicable design. This evaluation should include all elements of the quality system in order to show compliance with CAR 21 Subpart G.

**GM 21.143Exposition – Production organisation exposition**

The purpose of the POE is to set forth in a concise document format the organizational relationships, responsibilities, terms of reference, and associated authority, procedures, means and methods of the organisation.

The information to be provided is specified in 21.143(a). Where this information is documented and integrated in manuals, procedures and instruction, the POE should provide a summary of the information and an appropriate cross reference.

DGCA requires the POE to be an accurate definition and description of the production organisation. The document does not require approval in itself, but it will be considered as such by virtue of the approval of the organisation.

When changes to the organisation occur, the POE is required to be kept up to date per a procedure, laid down in the POE. Significant changes to the organisation (as defined in GM 21.147(a)) should be approved by DGCA prior to update of the POE.

When an organisation is approved against any other implementing rule containing a requirement for an exposition, a supplement covering the differences may suffice to meet the requirements of CAR 21 Subpart G except that the supplement should have an index identifying where those parts missing from the supplement are covered. Those items then formally become part of the POE. In any combined documents the POE should be easily identifiable.

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**GM 21.145(a)Approval Requirements**

A facility is a working area where the working conditions and the environment are controlled as appropriate in respect of: cleanliness, temperature, humidity, ventilation, lighting, space/access, noise, air pollution.

Equipment and tools should be such as to enable all specified tasks to be accomplished in a repeatable manner without detrimental effect. Calibration control of equipment and tools which affect critical dimensions and values should show compliance with, and be traceable to, national or international standards.

Sufficient personnel means that the organisation has for each function according to the nature of the work and the production rate, a sufficient quantity of qualified personnel to accomplish all specified manufacturing tasks and to attest the conformity. Their number should be such that airworthiness consideration may be applied in all areas without undue pressure.
An evaluation of the competence of personnel is performed as part of the quality system. This should include, where appropriate, verification that specific qualification standards have been implemented, for example NDT, welding, etc. Training should be organised to establish and maintain the personal competence levels determined by the organisation to be necessary

**GM 21.145(b)(2)Approval Requirements – Airworthiness, noise, fuel venting and exhaust emissions /production data procedures**

1 When a POA holder/applicant is developing its own manufacturing data, such as computer based data, from the design data package delivered by a design organisation, procedures are required to demonstrate the right transcription of the original design data.
2 Procedures are required to define the manner in which airworthiness, noise, fuel venting and exhaust emissions data is used to issue and update the production/quality data, which determines the conformity of products, parts and appliances. The procedure must also define the traceability of such data to each individual product, part or appliance for the purpose of certifying condition for safe operation and issuing a Statement of Conformity or Form CA-1.

**GM 21.145(c)(1)Approval Requirements – Accountable manager**

Accountable manager means the manager who is responsible, and has corporate authority for ensuring that all production work is carried out to the required standard. This function may be carried out by the Chief Executive or by another person in the organisation, nominated by him or her to fulfil the function provided his or her position and authority in the organisation permits to discharge the attached responsibilities.

The manager is responsible for ensuring that all necessary resources are available and properly used in order to produce under the production approval in accordance with CAR 21, Subpart G.

The manager needs to have sufficient knowledge and authority to enable him or her to respond to DGCA regarding major issues of the production approval and implement necessary improvements.

The manager needs to be able to demonstrate that he or she is fully aware of and supports the quality policy and maintains adequate links with the quality manager.

**GM 21.145(c)(2)Approval Requirements – Responsible managers**

The person or persons nominated should represent the management structure of the organisation and be responsible for all functions as specified in CAR 21, Subpart G. It therefore follows that, depending on the size of the CAR 21, Subpart G organisation, the functions may be subdivided under individual managers (and in fact may be further subdivided) or combined in a variety of ways.

DGCA requires the nominated managers to be identified and their credentials submitted to DGCA in order that they may be seen to be appropriate in terms of relevant knowledge and satisfactory experience related to the nature of the production activities as performed by the CAR 21, Subpart G organisation.

The responsibilities and the tasks of each individual manager are required to be clearly defined, in order to prevent uncertainties about the relations, within the organisation. In the case of organisation structures where staff-members are responsible to more than one person, as for instance in matrix and project organisations, responsibilities of the managers should be defined in such a way that all responsibilities are covered.

Where a CAR 21, Subpart G organisation chooses to appoint managers for all or any combination of the identified CAR 21 functions because of the size of the undertaking, it is necessary that these managers report ultimately to the accountable manager. In cases where a manager does not directly report to the accountable manager, he or she should have a formally established direct access to the accountable manager.

One such manager, normally known as the quality manager, is responsible for monitoring the organisation's compliance with CAR 21, Subpart G and requesting remedial action as necessary by the other managers or the accountable manager as appropriate. He or she should have a direct access to the accountable manager.

**AMC 21.145(d)(1)Approval Requirements – Certifying staff**

1. Certifying Staff are nominated by the production organisation to ensure that products, parts, and/or appliances qualify for Statements of Conformity or Release Certificates. Certifying Staff positions and numbers are to be appropriate to the complexity of the product and the production rate.
2. The qualification of certifying staff is based on their knowledge, background and experience and a specific training (or testing) established by the organisation to ensure that it is appropriate to the product, part, or appliance to be released.

3. Training must be given to develop a satisfactory level of knowledge of organization procedures, aviation legislation, and associated rules, CS/FAR and GM/AC, relevant to the particular role.
4. For that purpose, in addition to general training policy, the organisation must define its own standards for training, including pre-qualification standards, for personnel to be identified as certifying staff.
5. Training policy is part of the Quality System and its appropriateness forms part of investigation by DGCA within the organisation approval process and subsequent surveillance of persons proposed by managers.
6. The training must be updated in response to experience gained and changes in technology.
7. A feedback system to ascertain that the required standards are being maintained must be put in place to ensure the continuing compliance of personnel to authorisation requirements.
8. For release of products, parts or appliances, the responsibilities to issue statements of conformity/release certificates (Form CA-1) or carry out Special Flight Permit operation including evaluation of flight conditions as per the procedures agreed by DGCA are allocated to the certifying staff identified in 21.145 (d)(2).
9. DGCA holds the right to reject those personnel, appointed by the organisation, if found to have inappropriate experience or not to otherwise comply with its requirements.

**AMC 21.145(d)(2)Approval Requirements – Record of certifying staff**

1 The following is the minimum information to be recorded in respect of each certifying person:

a Name
b Date of Birth
c Basic Training and standard attained
d Specific Training and standard attained
e If appropriate – Continuation Training
f Experience
g Scope of the authorisation
h Date of first issue of the authorisation
i If appropriate – expiry date of the authorization
j Identification Number of the authorisation

2 The record may be kept in any format and must be controlled by an internal procedure of the organisation. This procedure forms part of the quality system.

3 Persons authorised to access the system must be maintained at a minimum to ensure that records cannot be altered in an unauthorised manner and that confidential records cannot become accessible to unauthorised persons.
4 The certifying person must be given reasonable access on request to his or her own records.
5 Under the provision of 21.157, DGCA has a right of access to the data held in such a system.
6 The organisation must keep the record for at least two years after the certifying person has ceased employment with the organisation or withdrawal of the authorisation, whichever is the sooner.

**AMC 21.145(d)(3)Approval requirements – Evidence of authorization**

1 The authorisation document must be in a style that makes its scope clear to the certifying staff and any authorised person who may require to examine the authorisation. Where codes are used to define scope, an interpretation document should be readily available.

2 Certifying staff are not required to carry the authorisation document at all times but should be able to make it available within a reasonable time of a request from an authorized person. Authorised persons include concerned DGCA officials.

**GM 21.147(a)Changes to the approved production organisation – Significant changes**

1. Changes to be approved by DGCA include:

- Significant changes to production capacity or methods.
- Changes in the organisation structure especially those parts of the organisation in charge of quality.
- A change of the accountable manager or of any other person nominated under 21.145 (c)(2).
- Changes in the production or quality systems that may have an important impact on the conformity/airworthiness of each product, part or appliance.
- Changes in the placement or control of significant sub-contracted work or supplied parts.

2. To ensure that changes do not result in non-compliance with CAR 21, Subpart G it is in the interest of both DGCA and the approval holder to establish a relationship and exchange information that will permit the necessary evaluation work to be conducted before the implementation of a change. This relationship should also permit agreement on the need for variation of the terms of approval (ref 21.143(a)(9)).

3. Where a change of name or ownership results in the issue of a new approval, the investigation will normally take account of DGCA's knowledge and information from the preceding approval.

4 Changes of location are addressed in 21.148 and changes of ownership in 21.149, change of scope of approval in 21.153.

**AMC 21.148Changes of location – Management during change of location**

1. The relocation of any work, to an unapproved location, or a location with inappropriate scope of approval, constitutes a change of significance to the organisation and requires approval by DGCA as prescribed in 21.147. An unapproved relocation will invalidate the production organisation approval, and may necessitate re-application for any similar approval required at the new location. However, suitable transitional arrangements may be agreed with DGCA, in advance of the relocation, which can allow continuation of the approval.

2. When an organisation expands its facility to include a new production location or moves parts of its production to a new location the production organisation approval may continue in force, but the approval does not include the new location until DGCA has indicated its satisfaction with the arrangements.

3. For a change in location, taking an extended period of time, suitable transitional arrangements would require preparation of a co-ordination plan for the removal. The plan must, at least, identify the following:

    a. A clearly identified person, or group of persons, responsible for co-ordinating the removal and acting as focal point for communication with all parties, including DGCA.

    b. The basis of the co-ordination plan, e.g., whether by product or area.

    c. Planned timing of each phase of relocation.

    d. Arrangements for maintaining the standards of the approval up to the point where the production area is closed down.

    e. Arrangements for verifying continued production quality upon resumption of work at the new location.

    f. Arrangements for check and/or re-calibration of inspection aids or production tools and jigs before resuming production.

    g. Procedures which ensure that goods are not released from the new location until their associated production and quality systems have been verified.

    h. Arrangements for keeping DGCA informed of progress with the relocation.

4. From the co-ordination plan, DGCA can determine the points at which it wishes to conduct investigation.

5. If an agreed co-ordination plan is in operation, DGCA will normally allow the existing approval to remain in force and will, where appropriate, grant an additional approval to cover the new address for the duration of the move.

**GM 21.149Transferability**

Transfer of approval would normally only be agreed in cases where the ownership changes but the organisation itself remains effectively unchanged. For example:

An acceptable transfer situation could be a change of company name (supported by the appropriate certificate from the Indian Companies Registration Office or equivalent) but with no changes to site address, facilities, type of work, staff, accountable manager or persons nominated under 21.145.

Alternatively, in the event of receivership (bankruptcy, insolvency or other equivalent legal process) there may be good technical justification for continuation of the approval provided that the company continues to function in a satisfactory manner in accordance with their POE. It is likely that at a later stage the approval might be voluntarily surrendered or the organization transferred to new owners in which case the former paragraphs apply. If it does not continue to operate satisfactorily then DGCA could suspend or revoke the approval.

In order for DGCA to agree to a transfer of approval, it will normally prescribe it as a condition in accordance with 21.147(b) that the obligations and responsibilities of the former organisation should be transferred to the new organisation, otherwise transfer is not possible and application for a new approval will be required.

**GM 21.151Terms of approval – Scope and categories**

Terms of approval document(s) will be issued by DGCA under 21.135 to identify the scope of work, the products, and/or categories for which the holder is entitled to exercise the privileges defined in 21.163.

The codes shown against each scope of work item are intended for use by DGCA for purposes such as managing, administering and filing details of approvals. It may also assist in the production and publication of a list of approval holders.

The scope of work, the Products, Parts, or Appliances for which the POA holder is entitled to exercise the privileges defined in 21.163will be described by DGCA as follows:

FOR PRODUCTS:

1 General area, similar to the titles of the corresponding certification codes.
2 Type of Product, in accordance with the type-certificate.

FOR PARTS AND APPLIANCES:

1 General area, showing the expertise, e.g., mechanical, metallic structure.
2 Generic type, e.g., wing, landing gear, tires.

| SCOPE OF WORK | PRODUCTS/CATEGORIES |
|---|---|
| A1 Large Aeroplanes<br>A2 Small Aeroplanes<br>A3 Large Helicopters<br>A4 Small Helicopters<br>A6 Sailplanes<br>A8 Manned Balloon<br>A11 Very Light Aeroplanes<br>A12 Other | State types<br>“<br>“<br>“<br>“<br>“<br>“<br>“<br>“<br>“ |
| B1 Turbine Engines<br>B2 Piston Engines<br>B3 APU’s<br>B4 Propellers | “<br>“<br>“<br>“ |
| C1 Appliances:<br><br><br><br><br><br><br><br>C2 Parts: | State appliance generic types<br>(e.g., Tyres, Altimeter, etc.)<br>Examples include:<br>Avionic, Com/Nav/Pulse<br>Computer System,<br>Aircraft/Engine/Avionic<br>Instruments, Mechanical/Electrical/<br>Gyroscopic/Electronic<br>Mechanical/Hydraulic/Pneumatic<br><br>State part generic types<br>(e.g., Wing, Landing Gear, etc.)<br>Examples include:<br>Structural, Metallic/non-metallic<br>Mechanical/Hydraulic/Pneumatic<br>Electrical Electronic |
| D1 Maintenance | State aircraft types |

**AMC 21.153Changes to the terms of approval – Application for a change to the terms of approval**

Form CA-51 must be obtained from DGCA/ DGCA website and completed in accordance with the procedures of the POE.

The information entered on the form is the minimum required by DGCA to assess the need for change of the production organization approval.

The completed form and an outline of the changed production organization exposition, and details of the proposed change to POA terms of approval must be forwarded to DGCA.

**GM 21.157Investigations – Arrangements**

The arrangements made by the applicant for, or holder of an approval under CAR 21 Subpart G should allow DGCA to make investigations that include the complete production organisation including partners, sub-contractors and suppliers, whether they are in the India or not.

The investigation may include; audits, enquiries, questions, discussions and explanations, monitoring, witnessing, inspections, checks, flight and ground tests and inspection of completed products, parts or appliances produced under the POA.

In order to maintain its confidence in the standards achieved by a POA holder or applicant, DGCA may make an investigation of a sample product, part or appliance and its associated records, reports and certifications.

The arrangements should enable the organisation to give positive assistance to DGCA and co-operate in performing the investigation during both initial assessment and for the subsequent surveillance to maintain the POA.

Co-operation in performing investigation means that DGCA has been given full and free access to the facilities and to any information relevant to show compliance to CAR 21 Subpart G requirements, and assistance (personnel support, records, reports, computer data, etc, as necessary).

Assistance to DGCA includes all appropriate means associated with the facilities of the production organisation to allow DGCA to perform these investigations, such as the availability of a meeting room, office and personnel support, documentation and data, and communication facilities, all properly and promptly available as necessary.

DGCA seeks to have an open relationship with the organisation and suitable liaison personnel should be nominated to facilitate this, including suitable representative(s) to accompany DGCA officials during visits not only at the organisations own facilities but also at sub-contractors, partners or suppliers.

**GM No. 1 to 21.158(a) Uncontrolled non-compliance with applicable design data**

An uncontrolled non-compliance with applicable design data is a non-compliance:

- that can not be discovered through systematic analysis; or
- that prevents identification of affected products, parts, appliances, or materials.

**GM No. 2 to 21.158(a) Examples of level one findings**

Examples of level one findings are non-compliances with any of the following paragraphs, that could affect the safety of the aircraft:

21.139, 21.145, 21.147, 21.148, 21.151, 21.163, 21.165(b), (c), (d), (e), (f) and (g).

It should be anticipated that a non-compliance with these paragraphs is only considered a level one finding when objective evidence has been found that this finding is an uncontrolled non-compliance that could affect the safety of the aircraft.

In addition, the failure to arrange for investigations under 21.157, in particular to obtain access to facilities, after denial of one written request should be classified as a level one finding.

**GM 21.159(a)(3)Evidence of a lack of satisfactory control**

A positive finding by DGCA of:

1 an uncontrolled non-compliance with type design data affecting the airworthiness of product, part or appliance
2 an incident/accident identified as caused by POA holder
3 non-compliance with the POE and its associated procedures which could affect conformity of manufactured items to design data
4 insufficient competence of certifying staff
5 insufficient resources in respect of facilities, tools and equipment
6 insufficient means to ensure good production work standards
7 a lack of effective and timely response to prevent a recurrence of any of paragraph 1 to 6.

**AMC No. 1 to 21.163(c)Computer generated signature and electronic exchange of the Form CA 1**

**1. Submission to DGCA**

Any POA holder/applicant intending to implement electronic signature procedure to issue Form CA-1and/or to exchange electronically such data contained on the Form CA-1, should document it and submit it to DGCA as part of the documents attached with its exposition

**2. Characteristics of the** electronic system generating the Form CA 1

The electronic system Should

- guarantee secure access for each certifying staff;

- provide for a "personal" signature;

- ensure integrity and accuracy of the data certified by the signature of the Form and be able to show evidence of the authenticity of the CAR Form CA-1 (recording and record keeping) with suitable security, safeguards and backups;

- be active only at the location where the part is being released with a Form CA-1;

- not permit to sign a blank form;

- provide a high degree of assurance that the data has not been Modified after signature (if modification is necessary after issuance, i.e., re-certification of a part a new form with a new number and reference to the initial issuance should be made) ;

- provide for a 'personal' electronic signature, identifying the signatory. The signature should be generated only in the presence of the signatory

An electronic signature means data in electronic form which are attached to or logically associated with other electronic data and which serve as a method of authentication and should meet the following criteria:

- it is uniquely linked to the signatory;
- it is capable of identifying the signatory;
- it is created using means that the signatory can maintain under their sole control.

The electronic signature is defined as an electronically generated value based on a cryptographic algorithm and appended to data in a way to enable the verification of the data's source and integrity

POA holders/applicants are reminded that additional requirements may need to be satisfied when operating electronic systems.
The electronic system should be based on a policy and management structure (confidentiality, integrity and availability), such as:
- administrators, signatories;
- scope of authorisation, rights;
- password and secure access, authentication, protections, confidentiality;
- track changes;
- minimum blocks to be completed, completeness of information;
- archives;
- etc.

The electronic system generating the FORM CA 1 may contain additional data such as:
- manufacturer code;
- customer identification code;
- workshop report;

□inspection results;
□etc.
3. Characteristics of the Form CA 1 generated from the electronic system

To facilitate understanding and acceptance of the Form CA 1 released with an electronic signature, the following statement should be in Block 13b: 'Electronic Signature on File'.

In addition to this statement, it is accepted to print or display a signature in any form such as a representation of the hand-written signature of the person signing (i.e. scanned signature) or their name.

When printing the electronic form, the Form CA 1 should meet the general format as specified in this CAR -21. A watermark-type 'PRINTED FROM ELECTRONIC FILE' should be printed on the document.

When the electronic file contains a hyperlink to data, required to determine the airworthiness of the item(s), the data associated to the hyperlink, when printed, should be in a legible format and be identified as a reference from the Form CA 1.

Additional information not required by the Form CA 1 completion instructions may be added to the printed copies of Form CA 1 as long as the additional data do not prevent a person from filling out, issuing, printing, or reading any portion of the Form CA 1.This additional data should be provided only in block 12 unless it is necessary to include it in another block to clarify the content of that block.

4. Electronic exchange of the electronic Form CA 1

The electronic exchange of the electronic Form CA 1should be accomplished on a voluntary basis. Both parties (issuer and receiver) should agree on electronic transfer of the Form CA 1.

For that purpose, the exchange needs to include:
□all data of the Form CA 1, including data referenced from the Form CA 1;
□all data required for authentication of the Form CA 1.
In addition, the exchange may include:
□data necessary for the electronic format;
□additional data not required by the Form CA 1completion instructions, such as manufacturer code, customer identification code.

The system used for the exchange of the electronic Form CA 1 should provide:
□a high level of digital security; the data should be protected, unaltered or uncorrupted;
□traceability of data back to its source should be possible.

Trading partners wishing to exchange Form CA 1electronically should do so in accordance with these means of compliance stated in this document. It is recommended that they use an established, common, industry method such as Air Transport Association (ATA) Spec 2000 Chapter 16.

The applicant(s) is/are reminded that additional national and/or European requirements may need to be satisfied when operating the electronic exchange of the electronic Form CA 1.

The receiver should be capable of regenerating the Form CA 1from the received data without alteration; if not the system should revert back to the paper system. When the receiver needs to print the electronic form, refer to the subparagraph 3 above.

**AMC No 2 to 21A.163(c) – Completion of the FORM CA I**

FORM CA I Block 8 'Part Number'

The part number as it appears on the item, is usually defined in the design data; however in the case of a kit of parts, media containing software or any other specific condition of supply may be defined in production data developed from design data. Information about the contents of the kit or media may be given in block 12 or in a separate document cross-referenced from block 12.

FORM CA I Block 12 'Remarks'

Examples of conditions which would necessitate statements in block 12 are:
□When the certificate is used for prototype purposes the following statement must be entered at the beginning of block 12:

'NOT ELIGIBLE FOR INSTALLATION ON IN-SERVICE TYPE-CERTIFICATED AIRCRAFT'.
□Re-certification of items from 'prototype' (conformity only to non-approved data) to 'new' (conformity to approved data and in a condition for safe operation) once the applicable design data is approved.

The following statement must be entered in block 12:

RE-CERTIFICATION OF ITEMS FROM 'PROTOTYPE' TO 'NEW':

THIS DOCUMENT CERTIFIES THE APPROVAL OF THE DESIGN DATA [INSERT TC/STC NUMBER, REVISION LEVEL], DATED [INSERT DATE IF NECESSARY FOR IDENTIFICATION OF REVISION STATUS], TO WHICH THIS ITEM (THESE ITEMS) WAS (WERE) MANUFACTURED.
□When a new certificate is issued to correct error(s) the following statement must be entered in block 12:

'THIS CERTIFICATE CORRECTS THE ERROR(S) IN BLOCK(S) [ENTER BLOCK(S) CORRECTED] OF THE CERTIFICATE [ENTER ORIGINAL TRACKING NUMBER] DATED [ENTER ORIGINAL ISSUANCE DATE] AND DOES NOT COVER CONFORMITY/CONDITION/RELEASE TO SERVICE'.

Examples of data to be entered in this block as appropriate:
□For complete engines, a statement of compliance with the applicable emissions requirements current on the date of manufacture of the engine.

☐For ITSO articles, state the applicable ITSO number.
☐Modification standard.
☐Compliance or non-compliance with airworthiness directives or Service Bulletins.
☐Details of repair work carried out, or reference to a document where this is stated.
☐Shelf life data, manufacture date, cure date, etc.
☐Information needed to support shipment with shortages or re-assembly after delivery.
☐References to aid traceability, such as batch numbers.
In case of an engine, if the Competent Authority has granted an emissions production cut-off exemption the record: '["NEW OR SPARE"] ENGINE EXEMPTED FROM NOx EMISSIONS PRODUCTION CUT-OFF REQUIREMENT

**AMC 21.163(d)Privileges – Maintenance**

The applicant may apply for terms of approval, which cover maintenance of a new aircraft that it has manufactured, as necessary to keep it in an airworthy condition, but not beyond the point at which the applicable operational rules require maintenance to be performed by an approved maintenance organisation. If the production organisation intends to maintain the aircraft beyond that point, it would have to apply for and obtain an appropriate maintenance approval.

When DGCA is satisfied that the procedures required by 21.139 are satisfactory to control maintenance activities so as to ensure that the aircraft is airworthy, this capability will be stated in the terms of approval.

**MAINTENANCE OF AIRCRAFT**

Examples of such maintenance activities are:

- Preservation, periodic inspection visits, etc.
- Embodiment of a Service Bulletin.
- Application of airworthiness directives.
- Repairs.
- Maintenance tasks resulting from special flights.
- Maintenance tasks to maintain airworthiness during flight training, demo flights and other non-revenue flights

Any maintenance activities must be recorded in the Aircraft Log Book. It must be signed by certifying staff for attesting the conformity of the work to the applicable airworthiness data.

In some cases the Aircraft Log Book is not available, or the production organisation prefers to use a separate form (for instance for a large work package or for delivery of the aircraft to the customer). In these cases, production organisations must use Form CA-53 which must subsequently become part of the aircraft maintenance records.

**Maintenance of components outside the POA capability**

Such maintenance activity outside the capability of the Aircraft POA holder may still be accomplished under the production approval of the original release organisation. In such circumstances the engine(s), propeller(s), parts and appliances will require re-release in accordance with GM 21.163(c) (Form CA-1).

Records relevant to continued airworthiness or retirement lives, such as engine runs, flight hours, landings, etc., which affect part retirement of maintenance schedules must be specified on any re-release.

As an alternative the engine, propeller, part or appliance may be maintained by the holder of an approval in accordance with CAR 145, classified and released as 'used'.

**AMC 21.163(e) Procedure to carry out a Special Flight Permit including evaluation of the flight conditions**

**1. INTENT**

This acceptable means of compliance provides means to develop a procedure for carrying out a Special Flight Permit operation including evaluation of the flight conditions. Each POA applicant or holder must develop its own internal procedure following this AMC, in order to obtain the privilege of 21.163(e) for carrying out Special Flight Permit operation for an aircraft under procedures agreed with DGCA for production, when the production organisation itself is controlling under its POA the configuration of the aircraft and is attesting conformity with the design conditions approved for the flight.

**2. PROCEDURE TO CARRY OUT A SPECIAL FLIGHT PERMIT OPERATION**

**2.1 Content**

The procedure must address the following points:
- as relevant, in accordance with 21.710(b), the evaluation of flight conditions;
- conformity with approved conditions;
- perform the Special Flight Permit operation under the POA privilege;
- interface with DGCA officials for the flight.

**2.2 Evaluation of the flight conditions (when relevant)**

The procedure must include the process to establish and justify the flight conditions, in accordance with 21.708 and how compliance with 21.710(b) is established.

**2.3 Conformity with approved conditions**

The procedure must indicate how conformity with approved conditions is made, documented and attested by an authorized person.

**2.4 Interface with DGCA officials for the flight**

The procedure must include provisions describing the communication and liaison with DGCA officials for compliance with the requirements.

**GM 21.165(a)Obligations of the holder – Basic working document**

Compliance with the production organisation exposition (POE) is a prerequisite for obtaining and retaining a production organisation approval.

The organisation should make the POE available to its personnel, where necessary, for the performance of their duties. A distribution list should therefore be established. Where the POE mainly refers to separate manuals or procedures, the distribution of the POE could be limited.

The organisation should ensure that personnel have access to and are familiar with that part of the content of the POE or the referenced documents, which covers their activities.
Monitoring of compliance with the POE is normally the responsibility of the quality assurance function.

**GM No. 1 to 21.165(c)Obligations of the holder – Conformity of prototype models and test specimens**

21.33 requires determination of conformity of prototype models and test specimens to the applicable design data. The Form CA 1may be used as a conformity certificate as part of the assistance, a POA holder/applicant provides, to a design approval holder/applicant.

**GM No. 2 to 21.165(c)Obligations of holder – Conformity with type design**

Individual configurations are often based on the needs of the customer and improvements or changes which may be introduced by the type-certificate holder. There are also likely to be unintentional divergences (concessions or non-conformances) during the manufacturing process. All these changes should have been approved by the design approval holder, or when necessary by DGCA.

**GM No. 3 to 21.165(c)Obligations of the holder – Condition for safe operation**

Before issue of the Statement of Conformity to DGCA, the holder of a production organisation approval should make an investigation so as to be satisfied in respect of each of the items listed below. The documented results of this investigation should be kept on file by the POA holder. Certain of these items may be required to be provided (or made available) to the operator or owner of the aircraft (and in some cases to DGCA):

1. Equipment or modifications which do not meet the requirements of the State of manufacture but have been accepted by the authority of the importing country.

2. Identification of products, parts or appliances which:

   a Are not new.
   b Are furnished by the buyer or future operator (including those identified in 21.801 and 21.805).

3. Technical records which identify the location and serial numbers of components that have special traceability requirements for continued airworthiness purposes including those identified in 21.801 and 21.805.

4. Log book and a modification record book for the aircraft as required by DGCA.

5. Log books for products identified in 21.801 installed as part of the type design as required by DGCA.

6. A weight and balance report for the completed aircraft.

7. A record of missing items or defects which do not affect airworthiness, for example could be furnishing or BFE (Items may be recorded in a technical log or other suitable arrangement such that the operator and DGCA are formally aware).

8. Product support information required by the rules and associated CS/FAR or GM/AC, such as a Maintenance Manual, a Parts Catalogue, or MMEL all of which are to reflect the actual build standard of the particular aircraft including an Electrical load analysis and a wiring diagram.

9. Records which demonstrate completion of maintenance tasks appropriate to the test flight flying hours recorded by the aircraft. These records should show the relationship of the maintenance status of the particular aircraft to the manufacturers recommended maintenance task list and the MRB document/report.

10. Details of the serviceability state of the aircraft in respect of :

    (a) the fuel and oil contents,
    (b) provision of operationally required emergency equipment such as life rafts, etc.

11. Details of the approved interior configuration if different from that approved as part of the type design.

12. An approved Flight Manual which conforms to the build standard and modification state of the particular aircraft shall be available.

13. Show that inspections for foreign objects at all appropriate stages of manufacture have been satisfactorily performed.

14. The registration has been marked on the exterior of the aircraft as required by national legislation. Where required by national legislation fix a fireproof owners nameplate.

15. Where applicable there should be a certificate for noise and for the aircraft radio station.
16. The installed compass and or compass systems have been adjusted and compensated and a deviation card displayed in the aircraft.

17. Software criticality list.

18. A record of rigging and control surface movement measurements.

19. Details of installations which will be removed before starting commercial air transport operations (e.g., ferry kits for fuel, radio or navigation).

20. Where maintenance work has been performed under the privilege of 21.163(d) issue a release to service that includes a statement that the aircraft is in a condition for safe operation.

21. List of all applicable Service Bulletins and airworthiness directives that have been implemented.

**GM No. 4 to 21.165(c)Airworthiness Release or Conformity Certificate**

The Form CA-1, when used as a release certificate as addressed in 21.165(c)(2) and (3), may be issued in two ways:

- As an airworthiness release, only when by virtue of the arrangement described in 21.133(b) and (c), it can be determined that the part is airworthy.
- As a conformity Certificate, only when by virtue of the arrangement described in 21.133(b) and (c), it can be determined that the part conforms to applicable design data which is not (yet) approved, for a reason that is indicated in Block 12
- 
- Parts released with a Form CA-1 as a conformity Certificate are not eligible for installation in a type-certificated aircraft.

The Form CA-1 should only be used for Conformity release purposes when it is possible to indicate the reason that prevents its issue as for airworthiness release purposes.

**AMC 21A.165(c)(3) Applicable emissions requirements**

1. General

This determination is made according to the data provided by the engine type certificate holder. This data should allow the determination of whether the engine complies with the emissions production cut-off requirement of paragraph (d) of volume II, Part III, Chapter 2, paragraph 2.3.2 of Annex 16 to the Chicago Convention. It should be noted that in the case of engines for which the Competent Authority has granted an exemption from these requirements, the emissions requirements applicable are the regulatory levels defined in Volume II, Part III, Chapter 2, paragraph 2.3.2 c) of Annex 16 to the Chicago Convention.

2. Process and criteria for applying for exemptions against a NOx emissions production cut-of requirement.

2.1 Request

The organisation should submit a formal request to the DGCA signed by an appropriate manager, and copied to all other relevant organisations involved. The letter should include the following information for the Competent Authority to be in a position to review the application:

a) Administration

- Name, address and contact details of the organisation.

b) Scope of the request

- Engine type (model designation, type-certificate (TC) number, TC date, emission TC basis, ICAO Engine Emissions Databank Unique Identification (UID) Number);

- Number of individual engine exemptions requested;

- Duration (end date) of continued production of the affected engines.

- Designate whether the proposed exempted engines are 'spares' or 'new' and whom the engines will be originally delivered to.

Note: In the case where the engines are 'new' (new engines installed on new aircraft), and if this would result in a larger negative environmental impact as compared to exemptions only for spare engines, more detailed justification could be required to approve this application.

c) Justification for exemptions

When requesting an exemption for a 'new' engine, the organisation should, to the extent possible, address the following factors, with quantification, in order to support the merits of the exemption request:

- Technical issues, from an environmental and airworthiness perspective, which may have delayed compliance with the production cut-off requirement;

- Economic impacts on the manufacturer, operator(s) and aviation industry at large;

- Environmental effects. This should consider the amount of additional NOx emissions that will be emitted as a result of the exemption. This could include consideration of items such as:

— the amount that the engine model exceeds the NOx emissions standard, taking into account any other engine models in the engine family covered by the same type-certificate and their relation to the standard;

— the amount of NOx emissions that would be emitted by an alternative engine for the same application; and

— the impact of changes to reduce NOx on other environmental factors, including community noise and CO2 emissions;

- Impact of unforeseen circumstances and hardship due to business circumstances beyond the manufacturer's control (e.g. employee strike, supplier disruption or calamitous events);

- Projected future production volumes and plans for producing a compliant version of the engine model seeking exemption;

- Equity issues in administering the production cut-off among economically competing parties (e.g. provide rationale for granting this exemption when another manufacturer has a compliant engine and does not need an exemption taking into account the implications for operator fleet composition, commonality and related issues in the absence of the engine for which exemptions are sought);

- Any other relevant factors.

2.2 Evaluation process.

2.2.1. DGCA process the request in consultation with third Countries involved by contacting the relevant Design Organisation. DGCA advises the Competent Authority concerned during the process of granting exemptions. The advice from the DGCA should take the form of a letter sent to the Competent Authority.

2.2.2 The evaluation of an exemption request should be based on the justification provided by the organisation and on the following definitions and criteria:

a) Use of engines

'Spare engines' are defined as complete new engine units which are to be installed on in-service aircraft for maintenance and replacement. It can be presumed that exemption applications associated with engines for this purpose would be granted as long as the emissions were equal to or lower than those engines they are replacing. The application should include the other items described in points (a) and (b) of paragraph 2.1 above, but it would not need to include the items specified in point (c).
For spare engines, the evaluation of the exemption application would be conducted for record keeping and reporting purposes, but it would not be done for approval of an exemption.

'New engines' are defined as complete new engine units which are to be installed on new aircraft. They can only be exempted from a NOx production cut-off requirement if they already meet the previous standard (e.g. exemption from the CAEP/6 NOx production cut-off requirement of paragraph (d) of Volume II, Part III, Chapter 2, paragraph 2.3.2 of Annex 16 to the Chicago Convention is only possible if an engine type already meets the regulatory levels defined in Volume II, Part III, Chapter 2,paragraph 2.3.2 c) of Annex 16 to the Chicago Convention). Also, in order for and exemption to be granted for this type of engine the applicant must clearly demonstrate that they meet the criteria for an exemption by including items described in points (a), (b) and (c) of paragraph 2.1 above. The DGCA may require additional information regarding the appropriateness of the potential exemption.

b) Number of new engine exemptions should be based on a total number of engines and time period for delivery of these engines, which would be agreed at the
time the application is approved and based on the considerations explained in point (c) of paragraph 2.1 above. The number of engines exempted should not exceed 75 per engine type-certificate, and the end date of continued production of the affected engines should not exceed 31.12.2016. The number of exemptions is related to individual non-compliant engines covered under the same type-certificate.

Exemptions for new engines should be processed and approved by the DGCA, for both the manufacture of the exempted engines and the initial operator of the aircraft to which

they are to be fitted. Given the international nature of aviation , the DGCA should attempt to collaborate and consult on the details of exemptions. In the case where engine type certification is done through a reciprocity agreement between the Third Countries, the DGCA y should coordinate on the processing of exemptions and concur before approval is granted.

c) Other engines

Unlimited exemptions may be granted for continued production of spare engines having emissions equivalent to or lower than the engines they are replacing. Engines for use on aircraft excluded from the scope of the Basic Regulation - (e.g. military, customs, police, search and rescue, fire fighting, coastguard or similar activities or services) - are excluded from civil aircraft NOx production cut-off requirements.

2.3 Rejection of request

If the competent DGCA rejects the request for exemption, the response should include a detailed justification.

GM 21A.165(c)(3) Definitions of engine type certification date and production date
Volume II of Annex 16 to the Chicago Convention contains two different references to applicability dates:

- 'Date of manufacture for the first individual production model' which refers to the engine type certification date; and

- 'Date of manufacture for the individual engine' which refers to the production date of a specific engine serial number (date of Form CA-1). The second reference is used in the application of engine NOx emissions production cut-off requirement which specifies a date after which all in-production engine models must meet a certain NOx emissions standard.

21.165(c)(3) includes the production requirements and refers to paragraphs (b) and (d) of Volume II, Part III, Chapter 2, paragraph 2.3 of Annex 16 to the Chicago Convention.

**GM 21.165(d) and (h) Obligations of the holder – Recording and archiving system**

Records within a production environment satisfy two purposes. Firstly, they are required, during the production process to ensure that products, parts, or appliances are in conformity with the controlling data throughout the manufacturing cycle. Secondly, certain records of milestone events are needed to subsequently provide objective evidence that all prescribed stages of the production process have been satisfactorily completed and that compliance with the applicable design data has been achieved.

Therefore, the approved production organization should implement a system for the compilation and retention of records during all stages of manufacture, covering short-term and long-term records appropriate to the nature of the product and its production processes.

The management of such information should be subject to appropriate procedures in the Quality System required by 21.139.

All forms of recording media are acceptable (paper, film, magnetic, etc) provided they can meet the required duration for archiving under the conditions provided.

The related organisation procedures should:

- Identify records to be kept.
- Describe the organisation of and responsibility for the archiving system (location, compilation, format) and conditions for access to the information (e.g., by product, subject).
- Control access and provide effective protection from deterioration or accidental damage.
- Ensure continued readability of the records.
- Demonstrate to DGCA proper functioning of the records system.
- Clearly identify the persons involved in conformity determination.
- Define an archiving period for each type of data taking into account importance in relation to conformity determination subject to the following:

    a. Data which supports conformity of a product, part, or appliance should be kept for not less than three years from the issue date of the related Statement of Conformity or Authorized Release Certificate.
    b. Data considered essential for continuing airworthiness should be kept throughout the operational life of the product, part or appliance.

- Ensure that the recording and record-keeping system used by the partners, supplier and sub-contractors meet the objective of conformity of the product, part or appliance with the same level of confidence as for their own manufacture. They should define in each case who is to retain the record data (organisation or partner, supplier or sub-contractor). They should also define method for surveillance of the recording/record keeping system of the partners, suppliers or sub-contractors.

# Subpart H – Airworthiness certificates, Special Certificates of Airworthiness and Export Certificates of Airworthiness

**GM 21.187Use of Authorised Release Documents for Export – Additional Requirements for Import**

For engines and propellers, normally the importing authority requires an additional endorsement certifying specific compliance with import requirements.

For parts and appliances, except when there is a special notification from the importing country, no additional certification wording is needed and the intent of the requirement is met when the parts are shipped with an Authorised Release Certificate (Form CA-1) issued for airworthiness stating that the parts were manufactured in conformity with approved design data and are in condition for safe operation.

# Subpart I – Noise certificates

There are no AMC or GM items associated with this Subpart.

# Subpart JA – Design Organisation Approval
# Products or changes to products

**GM 21.A231Scope**

CAR 21 describes procedures for approval of products and of parts and appliances. With the consideration that approval of design organisations will enhance the quality of the work done for approval of products and of parts and appliances, for Design Organisation Approval (DOA), two categories have been defined –

1. JA: Type Certification and ITSO authorization for design/development of APU.
2. JB: Design of parts and appliances.

**GM No. 1 to 21.A239 (a)Design assurance system**

**1. Purpose**

This GM outlines some basic principles and objectives of 21.A239 (a).

**2. Definitions**

2.1 The design assurance system is the organisational structure, responsibilities, procedures and resources to ensure the proper functioning of the design organisation.

2.2 The design assurance means all those planned and systematic actions necessary to provide adequate confidence that the organisation has the capability

- to design products in accordance with the applicable airworthiness regulations and environmental protection requirements,
- to show and verify the compliance with these airworthiness regulations and environmental protection requirements, and
- to demonstrate to DGCA this compliance.

2.3 The "Type Investigation" means the tasks of the organisation in support of the type-certificate, supplemental type-certificate or other design approval processes necessary to show and verify and to maintain compliance with the applicable airworthiness regulations and environmental protection requirements.

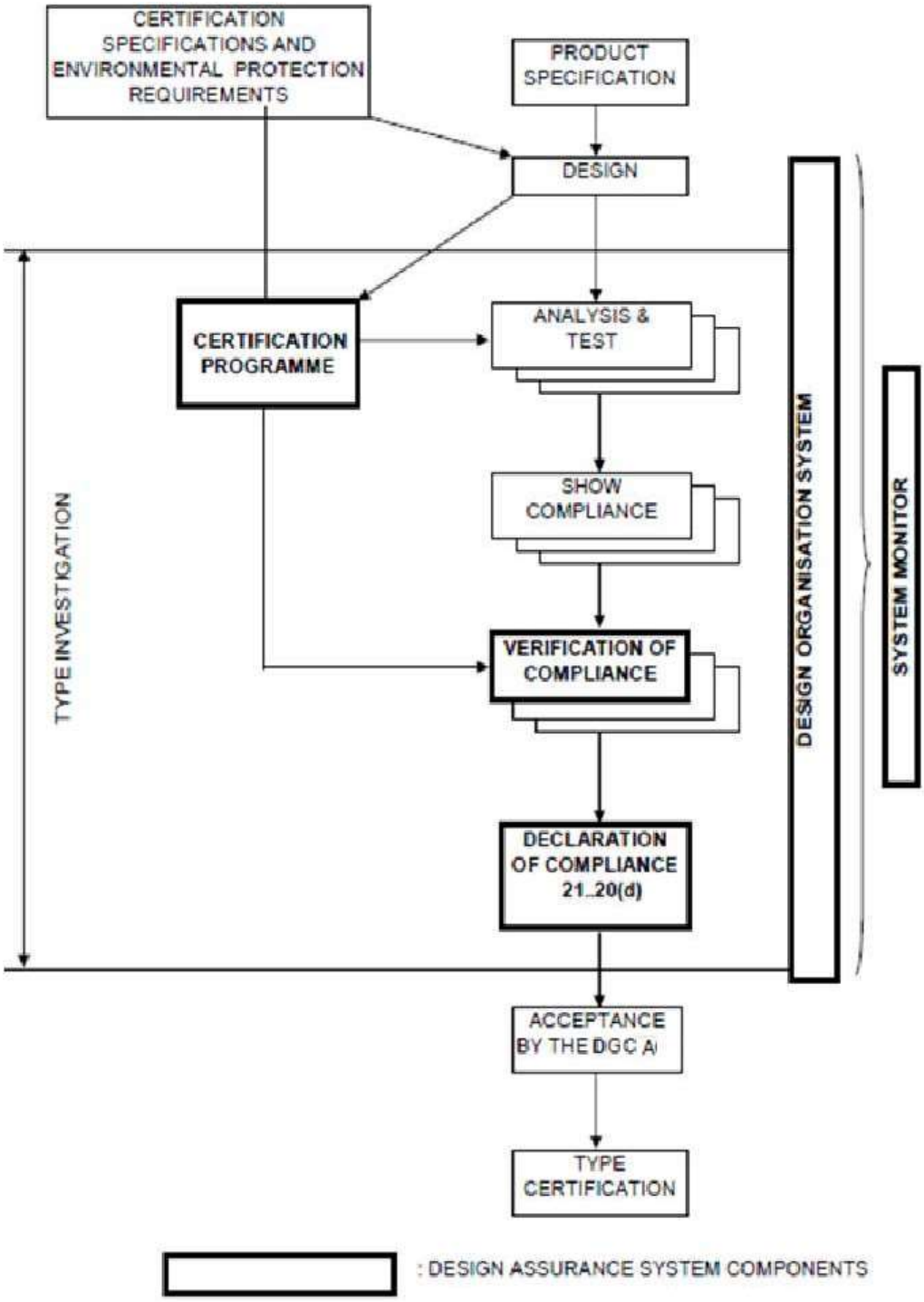



**Figure 1 - RELATIONSHIPS BETWEEN DESIGN, DESIGN ASSURANCE AND TYPE INVESTIGATION**

## 3. Design Assurance

The complete process, starting with the airworthiness regulations and environmental protection requirements and product specifications and culminating with the issuing of a type-certificate, is shown in the diagram on Figure 1. This identifies the relationship between the design, the Type Investigation and design assurance processes.

Effective Design Assurance demands a continuing evaluation of factors that affect the adequacy of the design for intended applications, in particular that the product, complies with applicable airworthiness regulations and environmental protection requirements and will continue to comply after any change.

Two main aspects should therefore be considered:

(1) How the planned and systematic actions are defined and implemented, from the very beginning of design activities up to continued airworthiness activities;

(2) How these actions are regularly evaluated and corrective actions implemented as necessary.

### 3.1 Planned and Systematic Actions

For design organisations carrying out Type Investigation of products, the planned and systematic actions should cover the following tasks and procedures be defined accordingly:

#### 3.1.1 General

a. To issue or, wherever applicable, supplement or amend the handbook in accordance with 21.A243, in particular to indicate the initiation of design activities on a product.
b. To assure that all instructions of the Handbook are adhered to.
c. To conduct Type Investigation.
d. To nominate staff as "compliance verification engineers" responsible to approve compliance documents as defined in paragraph 3.1.3.
e. To nominate personnel belonging to the Office of Airworthiness responsible as defined in paragraph 3.1.4.
f. In the case of an applicant for a supplemental type-certificate, to obtain the agreement of the type-certificate holder for the proposed supplemental type-certificate to the extent defined in 21.115.
g. To ensure full and complete liaison between the type design organisation and related organisations having responsibility for products manufactured to the type-certificate.
h. To provide the assurance to DGCA that prototype models and test specimens adequately conform to the type design (see 21.33(b)(1)).

#### 3.1.2 Chief Executive and Head of design organisation (or his or her Deputy)

a. The Chief Executive should provide the necessary resources for the proper functioning of the design organisation.
b. The Head of the design organisation, or an authorised representative, should sign a declaration of compliance (see 21.20(d) and 21.97(a)(3)) with the applicable airworthiness regulations and environmental protection requirements after verification of satisfactory completion of the Type Investigation. In accordance with 21.20(e) and 21.97(a)(4), his or her signature on the declaration of compliance confirms that the procedures as specified in the handbook have been followed (see also GM 21.A265(b)).
c. The functions of Chief Executive and Head of the design organisation may be performed by the same person.

3.1.3 Compliance Verification

a. Approval by signing of all compliance documents, including test programmes and data necessary for the verification of compliance with the applicable airworthiness regulations and environmental protection requirements as defined in the certification programme.
b. Approval of the technical content (completeness, technical accuracy), including any subsequent revisions, of the manuals approved by DGCA (Aircraft Flight Manual, the Airworthiness Limitations section of the Instructions for Continued Airworthiness and the Certification Maintenance Requirements (CMR) document, where applicable).

3.1.4 Office of Airworthiness

a. Liaison between the design organisation and DGCA with respect to all aspects of the certification programme.
b. Ensuring that a handbook is prepared and updated as required in 21.A243.
c. Co-operation with DGCA in developing procedures to be used for the type certification process.
d. Issuing of guidelines for documenting compliance.
e. Co-operation in issuing guidelines for the preparation of the manuals required by the applicable rules, Service Bulletins, drawings, specifications, and standards.
f. Ensuring procurement and distribution of applicable airworthiness regulations and environmental protection requirements and other specifications.
g. Co-operating with DGCA in proposing the type-certification basis
h. Interpretation of airworthiness regulations and environmental protection requirements and requesting decisions of DGCA in case of doubt.
i. Advising of all departments of the design organisation in all questions regarding airworthiness, environmental protection approvals and certification.
j. Preparation of the certification programme and co-ordination of all tasks related to Type Investigation in concurrence with DGCA.
k. Regular reporting to DGCA about Type Investigation progress and announcement of scheduled tests in due time.
l. Ensuring co-operation in preparing inspection and test programmes needed for demonstration of compliance.
m. Establishing the compliance checklist and updating for changes.

n. Checking that all compliance documents are prepared as necessary to demonstrate compliance with all airworthiness regulations and environmental protection requirements, as well as for completeness, and signing for release of the documents.
o. Checking the required type design definition documents described in 21.31 and ensuring that they are provided to DGCA for approval when required.
p. Preparation of a draft for a type-certificate data sheet and/or type certificate data sheet modification.
q. Providing verification to the head of the design organisation that all activities required for Type Investigation have been properly completed.
r. Propose the classification of changes in accordance with 21.91 and granting the approval for minor changes in accordance with 21.95(b).
s. Monitoring of significant events on other aeronautical products as far as relevant to determine their effect on airworthiness of products being designed by the design organisation.
t. Ensuring co-operation in preparing Service Bulletins and the Structural Repair Manual, and subsequent revisions, with special attention being given to the manner in which the contents affect airworthiness and environmental protection and granting the approval as per the procedures agreed with DGCA.
u. Ensuring the initiation of activities as a response to a failure (accident/incident/in-service occurrence) evaluation and complaints from the operation and providing of information to DGCA in case of airworthiness impairment (continuing airworthiness).
v. Advising DGCA with regard to the issue of airworthiness directives in general based on Service Bulletins.
w. Ensuring that the manuals approved by DGCA, including any subsequent revisions (the Aircraft Flight Manual, MMEL, the Airworthiness Limitations section of the Instructions for Continued Airworthiness and the Certification Maintenance Requirements (CMR) document, where applicable) are checked to determine that they meet the respective requirements, and that they are provided to DGCA for approval.

3.1.5 Maintenance and Operating Instructions

a. Ensuring the preparation and updating of all maintenance and operating instructions (including Services Bulletins) needed to maintain airworthiness (continuing airworthiness) in accordance with relevant airworthiness regulations. For that purpose, the applicant should establish the list of all documents it is producing to comply with applicable requirements of CS/FAR and define procedures and issue these documents, using wherever applicable and as per 21.A263(c)(3) privilege.

b. In accordance with 21.57, 21.61, 21.107, 21.119, 21.120 and 21.449, ensuring that these documents are provided to all affected operators and all involved authorities.

3.2 Continued Effectiveness of the design assurance system. The organisation should establish the means by which the continuing evaluation (system monitoring) of the design assurance system will be performed in order to ensure that it remains effective.

**GM No. 2 to 21.A239 (a) Design assurance system for minor changes to type design or minor repairs to products**

**1. Purpose**

This GM outlines some basic principles and objectives in order to comply with 21.A239(a) for organisations designing only minor changes to type design or minor repairs to products.

**2. Design assurance system**

The design assurance system should include the following:

- an organisational structure to:
  - control the design
  - demonstrate compliance with applicable airworthiness regulations and environmental protection requirements
  - independently check demonstrations of compliance
  - liaise with DGCA
  - continuously evaluate the design organisation
  - control sub-contractors
- procedures and responsibilities associated with the functions listed above, taking due account of CAR 21 requirements applicable to design and approval of minor changes to type design or minor repairs to products.

**GM 21.A239 (a) (3) Design assurance system**

With the objective of meeting the requirements of 21.A239 (a) (3), the design organization should have a group for independent monitoring and surveillance, fundamentally to ensure the proper compliance of design assurance system with the procedures including the responsibility to carry out internal audit of the organization. The group should report directly to HODO of the organization.

**AMC 21.A239 (a) (3) Design assurance system - Independent system monitoring**

The system monitoring function required by 21.A239 (a) (3) may be undertaken by the existing quality assurance organisation when the design organisation is part of a larger organisation.

**AMC 21.A239 (b) Design assurance system - Independent checking function of the demonstration of compliance**

1. The independent checking function of the demonstration of compliance should consist of the verification by a person not creating the compliance data. Such person may work in conjunction with the individuals who prepare compliance data.
2. The verification should be shown by signing compliance documents, including test programmes and data.
3. For a product, there is normally only one compliance verification engineer nominated for each relevant subject. A procedure should cover the non-availability of nominated persons and their replacement when necessary.
4. For STC cases, when compliance statement and associated documentation are produced by the TC holder, and when these data are approved under the system of the authority of TC holder, then the STC applicant does not need to provide, within

its own DOA, the independent checking function required in 21.A239 (b) for these data.

**GM 21.A239(c) Design assurance system**

In meeting the requirements of 21.A239(c) the applicant for a design organisation approval (DOA.), under Subpart JA may adopt the following policy:

1. The satisfactory integration of the Partner/Sub-contractor and applicant's design assurance systems should be demonstrated for the activities covered under the applicant's terms of approval.

2. In the event that a Partner/Sub-contractor holds a design organisation approval then in accordance with 21.A239(c), the applicant may take this into account in demonstrating the effectiveness of this integrated system.

3. When any Partner/Sub-contractor does not hold a DOA then the applicant will need to establish to its own satisfaction and to the satisfaction of DGCA, the adequacy of that partner's/sub-contractor's design assurance system in accordance with 21.A243 (b).

**AMC No. 1 to 21.A243 (a) Data requirements**

The handbook should provide the following information for each product covered by the design organisation approval.

- A description of the tasks which can be performed under the approval, according to the following classification:

    a. General areas, like subsonic turbojet aeroplanes, turbo propeller aeroplanes, small aeroplanes, rotorcraft.
    b. Technologies handled by the organisation (composite, wood or metallic construction, electronic systems, etc.)
    c. A list of types and models for which the design approval has been granted and for which privileges may be exercised, supported by a brief description for each product.
    d. For repair design, classification and (if appropriate) approval activities it is necessary to specify the scope of activity in terms of structures, systems, engines, etc.

2. A general description of the organisation, its main departments, their functions and the names of those in charge; a description of the line management and of functional relationships between the various departments.

3. A description of assigned responsibilities and delegated authority of all parts of the organisation which, taken together, constitute the organisation's design assurance system together with a chart indicating the functional and hierarchical relationship of the design assurance system to Management and to other parts of the organisation; also the chains of responsibilities within the design assurance system, and the control of the work of all partners and sub-contractors.

4. A general description of the way in which the organisation performs all the design functions in relation to airworthiness and environmental protection approvals including:

    a. The procedures followed and forms used in the Type Investigation process to ensure that the design of, or the change to the design of, the product as applicable is identified and documented, and complies with the applicable airworthiness regulations and environmental protection requirements, including specific requirements for import by importing authorities
    b. The procedures for classifying design changes as "major" or "minor" and for the approval of minor changes.
    c. The procedures for classifying and approving unintentional deviations from the approved design data occurring in production (concessions or non-conformance's).
    d. The procedure for classifying and obtaining approval for repairs.

5. A general description of the way in which the organisation performs its functions in relation to the continuing airworthiness of the product it designs, including co-operation with the production organisation when dealing with any continuing airworthiness actions that are related to production of the product, part or appliance, as applicable.

6. A description of the human resources, facilities and equipment, which constitutes the means for design, and where appropriate, for ground and flight testing.

7. An outline of a system for controlling and informing the Staff of the organisation of current changes in engineering drawings, specifications and design assurance procedures.

8. A description of the recording system for:
    a. The type design, including relevant design information, drawings and test reports, including inspection records of test specimens.
    b. The means of compliance.
    c. The compliance documentation (compliance check list, reports).

9. A description of the record keeping system to comply with 21.55 and 21.105.
10. A description of the means by which the organisation monitors and responds to problems affecting the airworthiness of its product during design, production and

in service in particular to comply with 21.3 (see also GM No. 1 to 21.A239, paragraphs 3.1.4(s) and (u)).

11. The names of the design organisation authorised signatories. Nominated persons with specific responsibilities such as mentioned in 21.33 and 21.35 should be listed.
12. (Reserved).
13. A clear definition of the tasks, competence and areas of responsibility of the Office of Airworthiness.
14. A description of the procedures for the establishment and the control of the maintenance and operating instructions (see 21.57, 21.61, 21.107, 21.119, 21.120 and 21.449).
15. A description of the means by which the continuing evaluation (system monitoring) of the design assurance system will be performed in order to ensure that it remains effective.

**AMC No. 2 to 21.A243(a)Data requirements - Model content of handbook for organisations designing minor changes to type design or minor repairs to products**

**Part 1. Organisation**

1.1 Objective of handbook and binding statement
1.2 Responsible person for administration of handbook
1.3 Amendment procedure
1.4 List of effective pages
1.5 Distribution list
1.6 Presentation of design organisation (including locations)
1.7 Scope of work (with identification of type and models of products)
1.8 Organisation charts
1.9 Human resources
1.10 Management staff
1.11 Certifying personnel (see GM No. 2 to 21.A243(d), paragraph 2)
1.12 Independent system monitoring

**Part 2. Procedures**

2.1 Management of changes to type design and design of repairs
- configuration control
- classification
- approval of minor changes to type design and minor repairs

2.2 Control of design subcontractors
2.3 Collecting/Investigating of failures, malfunctions and defects
2.4 Co-ordination with production
2.5 Documentation control
- in relations with the changes and repairs
- in relation with failures/malfunctions and defects (i.e. Service Bulletins)

2.6 Record keeping

**GM No. 1 to 21.A243 (d)Statement of qualifications and experience**

**1 Purpose**

This GM provides guidelines on the following points:

- Who are the persons covered by 21.A243 (d)?
- What is requested from the applicant for these persons?

**2 Who are the persons?**

Different types of functions are named or implicitly identified in the requirements of CAR 21 Subpart JA or in associated AMC and GM, using qualified and experienced personnel:

- the Chief Executive [see GM No. 1 to 21.A239(a), para. 3.1.2, GM 21.A249, GM 21.A265(b)]

- the other management staff:

  * the Head of the design organisation [see GM No. 1 to 21.A239(a), para.3.1.2, GM No. to 1 21.A245, para.4.1, GM 21.A265(b)]
  * the Chief of the office of Design [see GM No. 1 to 21.A245, para. 4.3]
  * the Chief of the Office of Airworthiness, or [see GM No. 1 to 21.A245, para. 4.2]
  * the Chief of the independent monitoring function of the design assurance system
    [see 21.A239(a)(3) and AMC No. 1 to 21.A243(a), para.2]

- the personnel making decisions affecting airworthiness and environmental protection:

  * compliance verification engineers [see GM No. 1 to 21.A239(a), para.3.1.3; AMC 21.A239(b)]
  * personnel of the Office of Airworthiness making decisions affecting airworthiness and environmental protection, especially those linked with the 21.A263 privileges (signing documents for release, and granting the approval of minor changes and minor repairs, granting the approval of Service Bulletins, and minor revisions to the aircraft flight manual) [see GM No. 1 to 21.A239(a), para. 3.1.4]

**3 Kind of statement**

**3.1 Chief Executive**

The Chief Executive should provide the necessary resources for the proper functioning of the design organisation.

A statement of the qualification and experience of the Chief Executive is normally not required.

### 3.2 Other management staff

The person or persons nominated should represent the management structure of the organization and be responsible through the Head of design organisation to the Chief Executive for the execution of all functions as specified in CAR 21, Subpart JA. Depending on the size of the organisation, the functions may be subdivided under individual managers. The nominated managers should be identified and their credentials furnished to DGCA.

The responsibilities and the tasks of each individual manager should be clearly defined, in order to prevent uncertainties about the relations, within the organisation. Responsibilities of the managers should be defined in a way that all responsibilities are covered.

### 3.3 Personnel making decisions affecting airworthiness and environmental protection

For these personnel, no individual statement is required. The applicant should show to DGCA that there is a system to select, train, maintain and identify them for all tasks where they are necessary.
The following guidelines for such a system are proposed:

* These personnel should be identified in the handbook, or in a document linked to the handbook. This, and the corresponding procedures, should enable them to carry out the assigned tasks and to properly discharge associated responsibilities.
* The needs, in terms of quantity of these personnel to sustain the design activities, should be identified by the organisation.
* These personnel should be chosen on the basis of their knowledge, background and experience.
* When necessary, complementary training should be established, to ensure sufficient background and knowledge in the scope of their authorization. The minimum standards for new personnel to qualify in the functions should be established. The training should lead to a satisfactory level of knowledge of the procedures relevant for the particular role.
* Training policy forms part of the design assurance system and its appropriateness forms part of investigation by DGCA within the organisation approval process and subsequent surveillance of persons proposed by the organisation.
* This training should be adapted in response to experience gained within the organization
* The organisation should maintain a record of these personnel which includes details of the scope of their authorisation. The personnel concerned should be provided with evidence of the scope of their authorisation.
* The following minimum information should be kept on record:
  a) Name
  b) Date of birth
  c) Experience and training
  d) Position in organisation
  e) Scope of the authorisation
  f) Date of first issue of the authorisation

g) If appropriate, date of expiry of the authorisation
h) Identification number of the authorisation.

The record may be kept in any format and should be controlled.

* Persons authorised to access the system should be maintained at a minimum to ensure that records cannot be altered in an unauthorised manner or that such confidential records do not become accessible to unauthorised persons.
* Personnel should be given access to their own record.
* Under the provision of 21.A257 DGCA has a right of access to the data held in such a system.
* The organisation should keep the record for at least two years after a person has ceased employment with the organisation or withdrawal of the authorisation, whichever is the sooner.

**GM No. 2 to 21.A243 (d)Data requirements - Statement of the qualification and experience- Organisations designing minor changes to type design or minor repairs to products**

For organisations designing minor changes to type design or minor repairs to products, the statement of the qualifications and experience required by 21.A243 (d) should be addressed as follows:

1. The nominated managers should be identified and their credentials submitted to DGCA in order that they may be seen to be appropriate in terms of relevant knowledge and satisfactory experience related to the nature of the design activities as performed by the organisation.

2. The persons responsible to:
   - propose to classify changes to type design or repairs
   - verify compliance [21.A239 (b)]
   - approve minor changes to type design and minor repairs [21.A263(c)(2)]
   - issue information or instructions [21.A263(c)(3)]
   - Propose 'Special Flight Permit' and 'flight conditions'

   should perform their functions in accordance with a procedure and criteria agreed with DGCA.

**GM No. 1 to 21.A245Requirements for approval**
**See 21.A245**

1. **General:** The data submitted in accordance with 21.A243 should show that sufficient skilled personnel are available and suitable technical and organisational provisions have been made for carrying out the Type Investigation defined by GM No. 1 to 21.A239 (a), paragraph 2.3.

2. **Personnel:** The applicant should show that the personnel available to comply with 21.A245 (a) are, due to their special qualifications and number, able to provide assurance of the design or modification of a product, as well as the compilation and verification of all data needed to meet the applicable airworthiness regulations and

environmental protection requirements while taking into account the present state of the art and new experience.

**3. Technical:** The applicant should have access to:

a. Workshops and production facilities which are suitable for manufacturing prototype models and test specimens.
b. Accommodation and test facilities which are suitable for carrying out tests and measurements needed to demonstrate compliance with the airworthiness regulations and environmental protection requirements. The test facilities may be subjected to additional technical conditions related to the nature of tests performed.

**4. Organisation**: The data submitted in accordance with 21.A243 should show that:

4.1 The Head of the design organisation for which an application for approval has been made, has the direct or functional responsibility for all departments of the organisation which are responsible for the design of the product. If the departments responsible for design are functionally linked, the Head of the design organisation still carries the ultimate responsibility for compliance of the organisation with CAR 21Subpart JA.

4.2 An Office of Airworthiness, or equivalent function, has been established and staffed on a permanent basis to act as the focal point for coordinating airworthiness and environmental protection matters (see GM No. 1 to 21.A239 (a) paragraph 3.1.4); it reports directly to the Head of the design organisation or is integrated into an independent quality assurance organisation reporting to the Head of the design organisation.

4.3 An Office of Design has been established within the design organisation and staffed on a permanent basis to handle all design related activities that are required to be carried out in terms of the product that the design organisation develops/ intends to develop. The Chief of the office of design has the functional responsibility of the office of design and reports directly to the Head of the design organisation.

4.4 Responsibilities for all tasks related to Type Investigations are assigned in such a way that gaps in authority are excluded.

4.5 The responsibility for a number of tasks as in paragraph 4.4 may be assigned to one person especially in the case of simple projects.

4.6 Co-ordination between technical departments and the persons in charge of the system monitoring required by 21.A239(a)(3) has been established :

- to ensure quick and efficient reporting and resolution of difficulties encountered using the handbook and associated procedures
- to maintain the design assurance system
- to optimise auditing activities.

**GM No. 2 to 21.A245Requirements for approval - Organisations designing minor changes to type design or minor repairs to products**

The data submitted in accordance with 21.A243 should show that:

1 The Head of the design organisation who has the direct or functional responsibility for all departments of the organisation shall also take the responsibility of the design of minor changes to type design or minor repairs to products.

2 Person(s) have been nominated to liaise with DGCA and to co-ordinate airworthiness and environmental protection matters.

3 Responsibilities for all tasks related to the design and approval of minor changes to type design or minor repairs to products are assigned to ensure that all areas are covered.

4 The responsibility for a number of tasks as in paragraph 3 may be assigned to one person especially in the case of simple projects.

**GM 21.A247Significant changes in the design assurance system**

In addition to a change in ownership (see 21.A249), the following changes to the design assurance system should be considered as "significant" to the demonstration of compliance or to the airworthiness or environmental protection of the products:

**1 Organisation**

* Relocation to new premises (see also GM 21.A249)
* Change in the industrial organisation (partnership, suppliers, design worksharing) unless it can be shown that the independent checking function of the demonstration of compliance is not affected
* Change in the parts of the organisation that contribute directly to the airworthiness or environmental protection (independent checking function, office of airworthiness [or equivalent])
* Change to the independent monitoring principles (see 21.A239 (a)(3))

**2 Responsibilities**

* Change of the management staff
  - the Head of the design organisation [GM No. 1 to 21.A239(a), para.3.1.2, GM No. 1 to 21.A245, para.4.1, GM 21.A265(b)]
  - the Chief of Design [GM No. 1 to 21.A245, para. 4.3]
  - the Chief of the Office of Airworthiness [GM No. 1 to 21.A245, para. 4.2]
  - the Chief of the independent monitoring function of the design assurance system [21.A239(a)(3) and AMC No. 1 to 21.A243(a), para.2]
* New distribution of responsibilities affecting airworthiness or environmental protection.
* For organisations designing minor changes to type design or minor repairs to products, change of the persons identified in GM No. 2 to 21.A243 (d).

**3 Procedures**

Change to the principles of procedures related to:

- the type certification
- the proposal of classification of changes and repairs and obtaining approval of " major " changes to design/ repair [21.A263(c)(1)]
- the treatment of major changes and major repairs
- the approval of the design of minor changes and minor repairs [21.A263(c)(2)]
- the issue of information and instructions under the privilege of 21.A263(c)(3)
- the approval of documentary changes to the Aircraft Flight Manual as per agreed procedures with DGCA [21.A263(c)(4)]
- continued airworthiness (see 21.3A and 3B)
- the configuration control, when airworthiness or environmental protection is affected
- the acceptability of design tasks undertaken by partners or subcontractors except those holding DOA as per CAR 21 JB.

**4 Resources**

* Substantial reduction in number and/or experience of staff (see 21.A245 (a)).

**GM 21.A249Transferability**

1. Transfer of the approval would normally only be agreed in cases where the organisation itself remains substantially unchanged.

2. An acceptable transfer situation could be for example a change of company name (supported by the appropriate certificate from the Indian Companies Registration Office or equivalent) but with no changes to site address or Chief Executive. However, if the same legal entity were to relocate to new premises with a new Chief Executive and/or new departmental heads, then a substantial investigation by DGCA would be necessary such that the change would be classified as a re-approval.

3. In the event of receivership there may be good technical justification for continuation of the approval provided that the company continues to function in a satisfactory manner. It is likely that at a later stage the approval might be surrendered by the receiver or transferred to another legal entity in which case the former paragraphs apply.

**GM No. 1 to 21.A251Terms of approval**

1 The terms of approval are stated on the certificate of approval issued by DGCA. The certificate states the scope of work and the products, changes or repairs thereof, with the appropriate limitations for which the approval has been granted. For design organisation approval covering type certification or ITSO authorisation for APU, the list of product types covered by the design assurance system should be included.

2 Approval of a change in the terms of approval in accordance with 21.A253 will be confirmed by an appropriate amendment of the certificate of approval.

3 The certificate references the handbook of the approved design organisation, provided in accordance with 21.A243. This handbook defines the tasks which may be performed under the approval.

4 Scopes of work are, for example, “subsonic turbojet aeroplanes”, “turboprop aeroplanes”, “small aeroplanes”, “rotorcraft” Technologies are quoted in the scope of work when it is considered by DGCA as a limitation for the design organisation approval.

5 For repair design activities, the certificate states the scope of work with the appropriate limitations for which the approval has been granted.

**GM No. 2 to 21.A251Terms of approval - Organisations designing minor changes to type design or minor repairs to products**

Terms of approval issued for organisations designing minor changes to type design or minor repairs to products [in accordance with 21.A233(b)] should contain:

**1. Scope of work**

This design organisation approval has been granted for:

- designing minor changes to type design or minor repairs to [aircraft, engine, propeller] in accordance with the applicable airworthiness regulations and environmental protection requirements,
- demonstrating and verifying the compliance with these airworthiness regulations and environmental protection requirements.

**2. Category of products**

Any other indication if DGCA has found a limitation related to aircraft systems or technologies and reducing the scope as defined in paragraph 1.

**3. Privileges**

The holder of this approval is entitled to:

List of the privileges granted with the approval, pursuant to 21.A263(c)(1), (2) and (3).

**GM 21.A257 (a) Investigations**

Arrangements that allow DGCA to make investigations include the complete design organization including partners, sub-contractors and suppliers, whether they are in India or not, assisting and co-operating with DGCA in performing inspections and audits conducted during initial assessment and subsequent surveillance.

Assistance to DGCA includes all appropriate means associated with the facilities of the design organisation to allow DGCA to perform these inspections and audits, such as a meeting room and office support.

**GM 21.A258 (a)(1)Examples of level one finding**

Examples of level one finding are non-compliances with any of the following paragraphs, that could lower the safety standard and hazards seriously the safety of the aircraft:

21.A239, 21.A245, 21.A247, 21.A251, 21.A263, 21.A265(a), (b), (c), (d) and (e).

It should be anticipated that a non-compliance with these paragraphs is only considered a level one finding when objective evidence has been found that this finding is a non-compliance that could affect the safety of the aircraft.

In addition, the failure to arrange for investigations under 21.A257, in particular to obtain access to facilities, after denial of one written request should be classified as a level one finding.

**GM 21.A263 (b)DOA privilege related to compliance documents**

A compliance document is the end result of a certification process, where the demonstration of compliance is recorded. For each specific certification process, DGCA is involved in the process itself at an early stage, especially through the establishment of the certification programme. The inspections or tests under 21.A257 (b) may be performed at various stages of the whole certification process, not necessarily when the compliance document is presented.

Therefore, according to the scheduled level of involvement, DGCA should agree with the DOA holder documents to be accepted without further DGCA verification under the DOA privilege of 21.A263 (b).

**AMC 21.A263 (b)(1)Compliance documents with conditions related to engine or propeller without a type-certificate or with unapproved changes and fitted on aircraft for which a Special Flight Permit is requested**

The establishment of flight conditions may include conditions related to engines/propellers without a type-certificate or with unapproved changes and fitted on the aircraft for which a Special Flight Permit is requested. These conditions (i.e. installation, operating, maintenance conditions or limitations) are defined by the organisation responsible for the design of the engine/propeller and provided to the organisation responsible for the design of the aircraft.

When the organisation responsible for the design of the engine/propeller has a DOA, the establishment and substantiation of these conditions must be done under the relevant DOA procedures. For that purpose, the associated documentation must be processed like any other compliance document. It must be provided to the organisation responsible for the design of the aircraft that will use it for the establishment of the aircraft flight conditions.

**AMC No. 1 to 21.A263(c)(1) Procedure for the classification of changes to type design and repairs as minor and major**

**1 INTENT**

This acceptable means of compliance provides means to develop a procedure for the classification of changes to type design and repairs.

Each DOA applicant must develop its own internal classification procedure following this AMC, in order to obtain the associated 21.A263(c)(1) privilege.

**2 PROCEDURE FOR THE CLASSIFICATION OF CHANGES TO TYPE DESIGN AND REPAIRS**

**2.1 Content**

The procedure must address the following points:
- the identification of changes to type design or repairs
- classification as per agreed procedures with DGCA
- justification of the classification
- authorised signatories
- supervision of changes to type design or repairs initiated by subcontractors

For changes to type design, criteria used for classification must be in compliance with 21.91 and GM 21.91.

For repairs, criteria used for classification must be in compliance with 21.435 and GM 21.435.

**2.2 Identification of changes to type design or repairs**

The procedure must indicate how the following are identified:

- major changes to type design or major repairs

- those minor changes to type design or minor repairs where additional work is necessary to demonstrate compliance with the airworthiness regulations and environmental protection requirements
- other minor changes to type design or minor repairs requiring no further demonstration of compliance.

**2.3 Proposal of Classification**

The procedure must show how the effects on airworthiness and environmental protection are analysed, from the very beginning, by reference to the applicable requirements.
If no specific airworthiness regulations or environmental protection requirements are applicable to the change or repairs, the above review must be carried out at the level of the part or system where the change or repair is integrated and where specific airworthiness regulations or environmental protection requirements are applicable.

**2.4 Justification of the classification**

Classification of changes to type design or repairs as "major" or "minor" must be recorded and, for those which are not straightforward, also documented. These records must be easily accessible to DGCA for sample check.

**2.5 Authorised signatories**

All classifications of changes to type design or repairs would be as per agreed procedures with DGCA.

The procedure must indicate the authorised signatories for the various products listed in the terms of approval.

For those changes or repairs that are handled by subcontractors, as described under paragraph 2.6, it must be described how the DOA holder manages its classification responsibility.

**2.6 Supervision of changes to type design or repairs initiated by subcontractors**
The procedure must indicate, directly or by cross-reference to written procedures, how changes to type design or repairs may be initiated and classified by subcontractors and are controlled and supervised by the DOA holder.

**AMC No. 2 to 21.A263(c)(1)Privileges - Organisations designing minor changes to type design or minor repairs to products : classification procedure**

**1. Content**
The procedure must address the following points:
- configuration control rules, especially the identification of changes to type design or repairs
- classification in consultation with DGCA, in compliance with 21.91 and GM 21.91 for changes and GM 21.435 for repairs

- justification of the proposal for classification as minor
- authorised signatories

**2. Identification of changes to type design or repairs**

The procedure must indicate how the following minor changes to type design or minor repairs are identified:

- those minor design changes to type design or minor repairs where additional substantiation data is necessary to demonstrate compliance with the airworthiness regulations or environmental protection requirements
- other minor design changes to type design or minor repairs requiring no further demonstration of compliance.

**3. Classification**

The procedure must show how the effects on airworthiness and environmental protection are analysed, from the very beginning, by reference to the applicable requirements.

If no specific requirements are applicable to the change or the repair, the above review must be done at the level of the part or system where the change or repair is integrated and where specific airworthiness regulations or environmental protection requirements are applicable. The final classification has to be done in consultation with DGCA.

For repair, see also GM 21.435.

**4. Justification of the classification**

All decisions of classification of changes to type design or repairs in consultation with DGCA, as "minor " must be recorded and, for those which are not straightforward, should also be documented. These records must be easily accessible to DGCA for sample check. It may be in the format of meeting notes or register.

**5. Authorised signatories**

All classifications of changes to type design or repairs must be accepted by an appropriate authorised signatory. The details of the Authorised signatories including name, position in the organisation, qualification, experience, trainings, etc., should be listed in the handbook. The procedure must indicate the authorised signatories for the various products listed in the terms of approval.

**AMC No. 1 to 21.A263(c)(2)Procedure for the approval of minor changes to type design or minor repairs**

**1 INTENT**

This acceptable means of compliance provides means to develop a procedure for the approval of minor changes to type design or minor repairs.

Each DOA applicant must develop its own internal procedures following this AMC, in order to obtain the associated privilege under 21.A263(c)(2).

## 2 PROCEDURE FOR THE APPROVAL OF MINOR CHANGES TO TYPE DESIGN OR MINOR REPAIRS

### 2.1 Content

The procedure must address the following points:
- compliance documentation
- approval under the DOA privilege
- authorised signatories
- supervision of minor changes to type design or minor repairs handled by subcontractors.

### 2.2 Compliance documentation

For those minor changes to type design or minor repairs where additional work to demonstrate compliance with the applicable airworthiness regulations and environmental protection requirements is necessary, compliance documentation must be established and independently checked as required by 21.A239(b).

The procedure must describe how the compliance documentation is produced and checked.

### 2.3 Approval under the DOA privilege

**2.3.1** For those minor changes to type design or minor repairs where additional work to demonstrate compliance with the applicable airworthiness regulations and environmental protection requirements is necessary, the procedure must define a document to formalise the approval under the DOA privilege.

This document must include at least:
- identification and brief description of the change or repair and reasons for change or repair
- applicable airworthiness regulations or environmental protection requirements and methods of compliance
- reference to the compliance documents
- effects, if any, on limitations and on the approved documentation
- evidence of the independent checking function of the demonstration of compliance
- evidence of the approval under the privilege of 21.A263(c)(2) by an authorised signatory
- date of the approval

For repairs, see AMC 21.433(a).

**2.3.2** For the other minor changes to type design or minor repairs, the procedure must define a means to identify the change or repair and reasons for the change or repair, and to formalise its approval by the appropriate engineering authority under an authorised signatory. This function may be delegated by the Office of Airworthiness but must be controlled by the Office of Airworthiness, either directly or through appropriate procedures of the DOA holder's design assurance system.

**2.4 Authorised signatories**

The persons authorised to sign for the approval under the privilege of 21.A263(c)(2) must be identified (name, signature and scope of authority) in appropriate documents that maybe linked to the handbook.

**2.5 Supervision of minor changes to type design or minor repairs handled by subcontractors**

For the minor changes to type design or minor repairs described in 2.3.2, that are handled by subcontractors, the procedure must indicate, directly or by cross-reference to written procedures how these minor changes to type design or minor repairs are approved at the subcontractor level and the arrangements made for supervision by the DOA holder.

**AMC No. 2 to 21.A263(c)(2)Privileges - Organisations designing minor changes to type design or minor repairs to products : procedure for the approval of minor changes to type design or minor repairs**

**1. Content**
The procedure must address the following points:
- compliance documentation
- approval under the DOA privilege
- authorised signatories

**2. Compliance documentation**
For those minor changes to type design or minor repairs where additional work to demonstrate compliance with the applicable airworthiness regulations and environmental protection requirements is necessary, compliance documentation must be established and independently checked as required by 21.A239 (b).

The procedure must describe how the compliance documentation is produced and checked.

**3. Approval under the DOA privilege**

**3.1.** For those minor changes to type design or minor repairs where additional work to demonstrate compliance with the applicable airworthiness regulations or environmental protection requirements is necessary, the procedure must define a document to formalise the approval under the DOA privilege.

This document must include at least:
- identification and brief description of the change or the repair and reason for change or repair
- applicable airworthiness regulations or environmental protection requirements and methods of compliance
- reference to the compliance documents
- effects, if any, on limitations and on the approved documentation
- evidence of the independent checking function of the demonstration of compliance

- evidence of the approval under the privilege of 21.A263(c)(2) by an authorised signatory
- date of the approval

For repairs, see also AMC 21.433(a).

**3.2.** For the other minor changes to type design or minor repairs, the procedure must define a means to identify the change or repair and reasons for the change or repair, and to formalise its approval by the appropriate engineering authority under an authorised signatory. This function must be controlled through appropriate procedures of the DOA holder's design assurance system.

**4. Authorised signatories**

The persons authorised to sign for the approval under the privilege of 21.A263(c)(2) must be identified (name, signature and scope of authority) in appropriate documents that may be linked to the handbook.

**GM 21.A263(c)(3)Issue of information or instructions**

**1 INTENT**

This GM provides guidelines to address the various aspects the DOA should cover in order to have a comprehensive procedure for the issue of information or instructions.

**2 SCOPE**

The information or instructions referred to in 21.A263(c)(3)are issued by a DOA holder to make available to the owners or operators of a product with all necessary data to implement a change on the product or a repair, or to inspect it. Some are also issued to provide maintenance organizations and other interested persons with all necessary maintenance data for the performance of maintenance, including implementation of a change on the product or a repair, or inspection, in accordance with 21.61, 21.107, 21.120 or 21.449 (Instructions for Continued Airworthiness).

This information or instructions may be issued in a format of a Service Bulletin as defined in Structural Repair Manuals, Maintenance Manuals, Engine and Propeller Manuals etc. The preparation of this data involves design, production and inspection. As the overall responsibility, through the privilege, is allocated to the DOA holder, the three aspects should be properly handled under the DOA to obtain the privilege "to issue information or instructions containing a statement that the technical content is approved", and a procedure should exist.

## 3 PROCEDURE

For the information and instructions issued under 21.A263(c)(3), the DOA holder should establish a procedure addressing the following points :

- preparation
- verification of technical consistency with corresponding approved change(s) , repair(s) or approved data, including affectivity, description, effects on airworthiness and environmental protection, especially when limitations are changed
- verification of the feasibility in practical applications
- authorised signatories.

The procedure should include the information or instructions prepared by subcontractors or vendors, and declared applicable to its products by the DOA holder.

## 4 STATEMENT

The statement provided in the information or instructions should also cover the information or instructions prepared by subcontractors or vendors and declared applicable to its products by the DOA holder.
The technical content is related to the design data and accomplishment instructions, and its approval means that:

- the design data has been appropriately approved ; and
- the instructions provide for practical and well defined installation/inspection methods, and when accomplished, the product is in conformity with the approved design data.

**Note:** Information and instructions related to required actions under 21.3B (b) (airworthiness directives) are submitted to DGCA to ensure compatibility with Airworthiness directive content (see 21.A265 (e)), and contain a statement that they are, or will be, subject to an airworthiness directive issued by DGCA.

**GM 21.A263(c)(4)Procedure for the approval of minor revisions to the Aircraft Flight Manual**

## 1 INTENT

This GM provides guidelines to develop a procedure for the approval of minor revisions to the Aircraft Flight Manual (AFM).

Each DOA applicant/holder should develop its own internal procedure, based on these guidelines, in order to obtain the associated privilege under 21.A263(c) (4).

## 2 MINOR REVISIONS TO THE AFM

2.1 The following revisions to the AFM are defined as minor revisions:

(a) Revisions to the AFM associated with changes to type design classified as minor in accordance with 21.91

(b) Revision to the AFM not associated with changes to type design (also identified as stand-alone revisions), that falls under one of the following:

- Changes to limitations or procedures that are achieved without altering or exceeding certification data (e.g. weight, structural, noise, etc.)
- Consolidation of two or more previously approved and compatible AFMs into one, or compilation of different parts taken from previously approved and compatible AFMs that are directly applicable to the subject aircraft
- The introduction of compatible and previously approved AFM amendments, revisions, appendices or supplements.

(c) Administrative revisions to the AFM, defines as follows:

(1) FOR AFM ISSUED BY THE TYPE-CERTIFICATE HOLDER

- Editorial revisions or corrections to the AFM.

- Changes to parts of the AFM that are not required to be approved by DGCA.

- Conversions of previously DGCA approved combinations of units of measurement added to the AFM in a previously approved manner.

- The addition of aircraft serial numbers to an existing AFM where the aircraft configuration as related to the AFM, is identical to aircraft already in that AFM.

- The removal of reference to aircraft serial numbers no longer applicable to that AFM.

- The translation of a DGCA approved AFM into the language of the State of Design or the State of Registration.

(2) FOR AFM SUPPLEMENTS ISSUED BY STC HOLDERS

Editorial revisions or corrections to the AFM Supplement.

- Changes to parts of the AFM that are not required to be approved by DGCA
- Conversions of previously DGCA approved combinations of units of measurement added to the AFM Supplement in a previously approved manner.
- The addition of aircraft serial numbers to an existing AFM Supplement where the aircraft configuration, as related to the AFM Supplement, is identical to aircraft already in that AFM Supplement.
- The addition of a new STC to an existing AFM supplement, when this supplement is fully applicable to the new STC
- The removal of reference to aircraft serial numbers no longer applicable to that AFM supplement.
- The translation of a DGCA approved AFM into the language of the State of Design or the State of Registration.

2.2 No other revision can be classified as minor, unless specifically agreed by the DGCA.

## 3 PROCEDURE FOR THE APPROVAL OF MINOR REVISIONS TO THE AFM

### 3.1 Content

The procedure should address the following points:

- preparation of all revisions to the AFM,
- classification as minor of the revision to the AFM,
- approval of the revisions to the AFM,
- approval statement,

### 3.2 Preparation

The procedure should indicate how revisions to the AFM are prepared and how the co-ordination with people in charge of design changes is performed.

### 3.3 Classification

The procedure should indicate how revisions to the AFM are classified as minor, in accordance with the criteria of paragraph 2.

All decisions of classification of minor revisions to the AFM that are not straightforward must be recorded and documented. These records must be easily accessible to the DGCA for sample check.

All classifications of minor revisions to AFM must be accepted by an appropriate authorised signatory.

The procedure must indicate the authorised signatories for the various products listed in the terms of approval.

### 3.4 Approval

The procedure should indicate how the approval under the privilege of 21.A.263(c)(4)will be formalised.

The authorised signatories should be identified (name, signature), together with the scope of authorisation, in a document that can be linked to the DOA handbook.

### 3.5 Approval statement

Revisions of the AFM under the privilege of 21.A.263(c)(4) should be issued with the approval statement defined in 21.A.263(c)(4)on the front page and/or in the log of revisions.

**AMC 21.A263(c)(6)Procedure for proposing for the approval conditions for issue of a Special Flight Permit**

**1 INTENT**

This AMC provides means to develop a procedure to determine that an aircraft can fly, under the appropriate restrictions compensating for non-compliance with the airworthiness codes applicable to the aircraft category. Each DOA applicant or holder must develop its own internal procedure following this AMC, in order to obtain the privilege as per an agreed upon procedure with DGCA to make this determination and propose for approval of associated conditions.

**2 PROCEDURE FOR THE APPROVAL OF THE CONDITIONS FOR ISSUE OF A SPECIAL FLIGHT PERMIT**

**2.1 Content**

The procedure must address the following points:

- decision to use the privilege;
- management of the aircraft configuration;
- determination of the conditions that must be complied with to perform safely a flight;
- documentation of flight conditions substantiations;
- approval under the DOA privilege, when applicable;
- concurrence of DGCA as per the agreed upon procedures
- authorised signatories.

**2.2 Decision to use the privilege of 21.A263(c)(6)**

The procedure must include a decision to determine:

- Flight conditions would be prepared and proposed by the DOA holder and shall be finalized after an agreed upon procedure with DGCA according to the criteria of 21.A263(c)(6).

**2.3 Management of the aircraft configuration**

The procedure must indicate:

- how the aircraft, for which an application for Special Flight Permit is made, is identified;
- how changes to the aircraft will be managed.

**2.4 Determination of the conditions that must be complied with to perform safely a flight**

The procedure must describe the process used by the DOA holder to justify that an aircraft can perform the intended flight(s) safely. This process should include:

- identification of deviations from applicable airworthiness codes or non compliance with CAR 21 conditions for the issue of a certificate of airworthiness;
- analysis, calculations, tests or other means used to determine under which conditions or restrictions the aircraft can perform safely a flight;
- the establishment of specific maintenance instructions and conditions to perform these instructions;

- independent technical verification of the analysis, calculations, tests or other means used to determine under which conditions or restrictions the aircraft can perform the intended flight(s) safely;
- statement by the office of airworthiness (or equivalent), that the determination has been made in accordance with the procedure and that the aircraft has no features and characteristics making it unsafe for the intended operation under the identified conditions and restrictions;
- approval by an authorised signatory after obtaining concurrence of DGCA as per an agreed upon procedure.

**2.5 Documentation of flight conditions substantiations**

1. The analysis, calculations, tests, or other means used to determine under which conditions or restrictions the aircraft can perform safely a flight, must be compiled in compliance documents. These documents must be signed by the person(s) performing the independent technical verification.
2. Each compliance document must have a number and issue date. The various issues of a document must be controlled.
3. The data submitted and approved by the type-certificate holder can be used as substantiations. In that case, the independent technical verification referred to in 2.4 is not required.

**2.6 Proposing for approval under the DOA privilege**

**2.6.1 Initial approval**

The procedure must include the following to support the proposal for approval under the DOA privilege:

| **FLIGHT CONDITIONS FOR A SPECIAL FLIGHT PERMIT – PROPOSAL FORM** | |
|---|---|
| **1. Applicant**<br>*[Name of organisation providing the flight conditions and associated substantiations]* | **2. Approval form number**<br>**Issue:**<br>*[number and issue, for traceability purpose]* |
| **3. Aircraft manufacturer / type** | **4. Serial number(s)** |
| **5. Purpose**<br>*[Purpose in accordance with 21.701(a)]* | |
| **6. Aircraft configuration**<br>The above aircraft for which a Special Flight Permit is requested is defined in *[add reference to the document(s) identifying the detailed configuration of the aircraft]*<br>*[For change(s) affecting the initial approval form: description of change(s). This form must be re-issued]* | |
| **7. Substantiations**<br>*[References to the document(s) justifying that the aircraft (as described in 5.) can perform the intended flight(s) safely under the defined conditions or restrictions.]*<br>*[For change(s) affecting the initial approval form: reference(s) to additional substantiation(s). This form must be re-issued]* | |
| **8. Conditions/Restrictions**<br>The above aircraft must be used with the following conditions or restrictions:<br>*[Details of these conditions/restrictions, or reference to relevant document, including specific maintenance instructions and conditions to perform these instructions)* | |
| **9. Statement**<br>The flight conditions have been established and justified in accordance with 21.708. The aircraft as defined in block 6 above has no features and characteristics making it unsafe for the intended operation under the identified conditions and restrictions. | |
| **10. Date of issue** | **11. Name and signature**<br>*[Authorised signatory]* |

**2.6.2 Approval of changes**

Except for changes that do not affect the conditions approved for the issue of the Special Flight Permit, the procedure must specify how changes will be approved by the DOA holder. The form of paragraph 2.6.1 must be updated.

**2.7 Authorised signatories**

The person(s) authorised to sign the approval form must be identified (name, signature and scope of authority) in the procedure, or in an appropriate document linked to the DOA handbook.

**AMC 21.A 265(a)Administration of the Handbook**

1 The handbook of the applicant must be in English language only.

2 The handbook must be produced in a concise form with sufficient information to meet 21.A243 relevant to the scope of approval sought by the applicant. The handbook must include the following:

a. Organisation name, address, telephone, telex and facsimile numbers.
b. Document title, and company document reference No (if any).
c. Amendment or revision standard identification for the document.
d. Amendment or revision record sheet.
e. List of effective pages with revision/date/amendment identification for each page.
f. Contents list or index.
g. A distribution list for the Handbook.
h. An introduction, or foreword, explaining the purpose of the document for the guidance of the organisation's own personnel. Brief general information concerning the history and development of the organisation and, if appropriate, relationships with other organisations which may form part of a group or consortium, must be included to provide background information for DGCA.
i. The approval must be reproduced in the document.
j. Identification of the department responsible for administration of the Handbook.

**NOTE**: In the case of an initial or revised approval it is recognised that certificate will be issued after DGCA agreement to the handbook content in draft form. Arrangements for formal publication in a timely manner must be agreed before the approval is issued.

3 An updating system must be clearly laid down for carrying out required amendments and modifications to the handbook.

4 The handbook may be completely or partially integrated into the company organization manual. In this case, identification of the information required by 21.A243 must be provided by giving appropriate cross references, and these documents must be made available, on request, to DGCA.

**GM 21.A265 (b) Use of the Handbook**

1 The handbook should be signed by the Chief Executive and the Head of the design organisation and declared as a binding instruction for all personnel charged with the development and type investigation of products.

2 All procedures referred in the handbook are considered as parts of the handbook and therefore as basic working documents.

# Subpart JB– Design Organisation Approval(Parts & Appliances)

**GM 21.B231Applicability**

Design of parts and appliances– Category JB. Due to the complexity of technology and design activities in the aeronautic field, organisations are very often orientated to a specific kind of activities and form consortia to build complete aircraft. It has been considered as useful to give Design Organisation Approvals to such organisations to simplify the overall Design Organisation Approval. A JB Design Organisation Approval is indeed the recognition of a capability to design a part or appliance under a general Design Assurance System.

When this recognition has been done and is continuously surveyed by DGCA, it is not necessary to re-assess completely an organisation when included in a consortium or other industrial relationship. The integration in the system only may be checked under the Design Organisation Approval of the TC applicant. This can be considered as an advantage to avoid duplication of work in the field of Design Organisation Approvals for both the applicant and DGCA.

**GM 21.B233Eligibility**

DGCA will normally agree that the following organisations are appropriate for approval under this Subpart JB-

a. Organisations having a major share of the design responsibility for a project
b. Organisations having competence to demonstrate compliance with requirements in an area of specialised technology e.g. control computers, software.
c. Organisations having competence to show compliance with requirements applicable to -
    1. Major parts of a product such as –
        - landing gear
        - major systems
        - engine compressor module

    2 Major items of equipment such as -
        - crew rest containers
        - galleys

DGCA may not agree such an approval would be appropriate, where it finds the total amount of work (of demonstrating compliance), to be subcontracted to the Organisation by various JA Organisations, is too little to justify DGCA workload required to investigate the Organisations.

**GM 21.B239 (a) Design assurance System**

**1 Purpose**

This AMC outlines some basic principles and objectives in order to comply with CAR 21.B239 (a).

**2 Definitions**

2.1 The Design Assurance System is the organisational structure, responsibilities, procedures and resources to ensure the proper functioning of the Design Organisation.

2.2 The Design Assurance is defined as all those planned and systematic actions necessary to provide adequate confidence that the organisation has the capability -

a. To design parts or appliances in accordance with the applicable airworthiness requirements;
b. To assist in showing and verify the compliance with these requirements; and
c. To make statements to the TC applicant/holder.

2.3 The "Type Investigation" means the tasks of the Organisation in support of the Type Certificate necessary to assist in demonstration and verifying and in maintaining compliance with the applicable airworthiness requirements.

**3 Design Assurance**

Effective Design Assurance demands a continuing evaluation of factors that affect the adequacy of the design for intended applications, in particular that the part or appliance, complies with applicable airworthiness requirements and will continue to comply after any change. Two main aspects should therefore be considered-

1. How the planned and systematic actions are defined and implemented, from the very beginning of design activities up to continued airworthiness activities.

2. How these actions are regularly evaluated and corrective actions implemented as necessary.

**NOTE:** Liaison with DGCA regarding Type Investigation requires the prior agreement of the TC applicant/holder.

3.1 Planned and Systematic Actions: For Design Organisations supporting Type Investigation, the planned and systematic actions should cover the following tasks and procedures should be defined accordingly:

3.1.1 General

a. To issue or, where applicable, supplement or amend the Handbook in accordance with 21.B243.
b. To assure that all instructions of the Handbook are adhered to.
c. To support Type Investigation.
d. To nominate individuals responsible for making statements to the TC applicant/ holder.
e. To nominate personnel belonging to the Office of Airworthiness responsible as defined in paragraph 3.1.4.
f. (Reserved)
g. To ensure full and complete liaison between the Type Design Organisation and related organisations having responsibility for parts or appliances manufactured to the Type Certificate.
h. To provide the assurance to the TC applicant/holder that prototype models and test specimens adequately conform to the Type Design.

3.1.2 Head of Design Organisation (or his Deputy). The Head of the Design Organisation is responsible to ensure that the statements made as defined in paragraph 2.2 above meet the applicable airworthiness requirements. He ensures that the procedures as specified in the handbook have been followed.

3.1.3 (Reserved)

3.1.4 Office of Airworthiness

a. (Reserved).
b. Ensuring that handbook is prepared and updated as required in CAR 21.B243.
c. Co-operation with the TC applicant / holder in developing procedures to be used for the Type Certification process.
d. Issuing of guidelines for documenting compliance.
e. Co-operation in issuing guidelines for the preparation of the manuals required by the applicable CARs, Service Bulletins, drawings, specifications, and standards.
f. Ensuring procurement and distribution of applicable airworthiness requirements and other specifications.
g. Co-operating with the TC applicant / holder in proposing the Type Certification basis including Special Conditions.
h. Interpretation of airworthiness requirements and requesting decisions of the TC applicant / holder in case of doubt.
i. Advising of all departments of the design organisation in all questions regarding airworthiness and certification.
j. Preparation of the certification programme and co-ordination of all tasks related to Type Investigation in support of the TC applicant / holder.
k. (Reserved)
l. Ensuring co-operation in preparing inspection and test programmes needed for demonstration of compliance.
m. (Reserved)
n. Checking that all statements are prepared as necessary to demonstrate compliance with all airworthiness requirements.
o. (Reserved)
p. (Reserved)

q. Providing verification to the Head of the Design Organisation that all activities to support Type investigation have been properly completed.
r. (Reserved)
s. Monitoring of significant events on other aeronautical products as far as relevant to determine their effect on airworthiness of parts and appliances being designed by the Design Organisation.
t. Ensuring co-operation in preparing Service Bulletins, with special attention being given to the manner in which the contents affect airworthiness.
u. Ensuring the initiation of activities as a response to a failure (accident/incident/in- service occurrences) evaluation and complaints from the operation and providing of information to the TC holder / applicant in case of airworthiness impairment (continuing airworthiness).
v. (Reserved)
w. Ensuring that each of the manuals required by applicable CARs are checked to determine that they meet the respective requirements.

3.1.5 Maintenance and Operating Instructions
a. Supporting the TC holder / applicant in the preparation and updating of all maintenance and operating instructions (including Service Bulletins) needed to maintain airworthiness (continuing airworthiness) in accordance with relevant CARs.
b. (Reserved)

3.2 Continued Effectiveness of the Design Assurance System. The Organisation should establish the means by which the continuing evaluation (system monitoring) of the Design Assurance System will be performed in order to ensure that it remains effective.

**GM 21.B239 (a) Design assurance system**

With the objective of meeting the requirements of 21.B239 (a), the design organization should have a group for independent monitoring and surveillance, fundamentally to ensure the proper compliance of design assurance system with the procedures including the responsibility to carry out internal audit of the organization. The group should report directly to HODO of the organization.

**GM 21.B239 (c) Design Assurance System**

In meeting the requirements of CAR 21.B239(c) the applicant for a Design Organisation Approval under Subpart JB may adopt the following policy:

1. The satisfactory integration of the Partner/Sub-contractor and applicant's Design Assurance Systems should be demonstrated for the activities covered under the applicant's Terms of Approval.
2. In the event that a Partner/Sub-contractor holds a Design Organisation Approval (DOA), then in accordance with CAR 21.B239(c), the applicant may take this into account in demonstrating the effectiveness of this integrated system.
3. When any Partner/Sub-contractor does not hold a D.O.A. then the applicant will need to establish to its own satisfaction and the satisfaction of DGCA, the adequacy

of that partner's/sub-contractor's Design Assurance System in accordance with CAR 21.B243(b).

**AMC 21.B243 (a) Data requirements**

The handbook should provide the following information –

1. A description of the tasks which can be performed under the approval, according to the following classification:
   a. General areas, like wings, fuselages, undercarriages, engine turbines.
   b. Technologies handled by the Organisation (composite, wood or metallic construction, electronic systems etc.)
   c. (Reserved)
2. A general description of the Organisation, its main departments, their functions and the names of those in charge; a description of the line management and of functional relationships between the various departments.
3. A description of assigned responsibilities and delegated authority of all parts of the Organisation which, taken together, constitute the Organisation's Design Assurance System together with a chart indicating the functional and hierarchical relationship of the Design Assurance System to Management and to other parts of the Organisation; also the chains of responsibilities within the Design Assurance System, and the control of the work of all partners and sub-contractors.
4. A general description of the way in which the Organisation performs all the design functions in relation to airworthiness including -
   a. The procedures followed and forms used in the Type investigation process to ensure that the design of, or the change to the design of, parts or appliances, as applicable is identified and documented, and complies with the product designer's specification (which shall cover applicable airworthiness requirements).
   b. (Reserved)

5. A general description of the way in which the Organisation performs its function in relation to the continuing airworthiness of a part or appliance it designs, including co-operation with the production organisation when dealing with any continuing airworthiness actions that are related to production of the product, part or appliance, as applicable.

6. A description of the human resources, facilities and equipment, which constitutes the means for design, and where appropriate, for ground and flight testing.

7. An outline of a system for controlling and informing the Staff of the Organisation of current changes in engineering drawings, specifications and design assurance procedures.
8. (Reserved)
9. A description of the archives policy system.
10. (Reserved)
11. The names of the Design Organisation authorised signatories. Nominated persons with specific responsibilities such as mentioned in CAR 21.33 and 21.35 should be listed.
12. (Reserved)
13. A clear definition of the tasks, competence and areas of responsibility of the Office of Airworthiness.
14. (Reserved)
15. A description of the means by which the continuing evaluation (system monitoring) of the Design Control System will be performed in order to ensure that it remains effective.

**GM 21.B243 (d) Statement of qualifications and experience**

**1 Purpose**

This GM provides guidelines on the following points:
- Who are the persons covered by 21.B243(d)?
- What is requested from the applicant for these persons?

**2 Who are the persons?**

Different types of functions are named or implicitly identified in the requirements of CAR 21 Subpart JB or in associated AMC and GM, using qualified and experienced personnel:
- the Chief Executive [see GM 21.B239(a), para. 3.1.2, GM 21.B249, GM 21.B265(b)]

- the other management staff:
  * the Head of the design organisation [see GM No. 1 to 21.B239(a), para.3.1.2, GM 21.B245, para.4.1, GM 21.B265(b)]
  * the Chief of the office of Design [see GM 21.B245, para 4.3]
  * the Chief of the Office of Airworthiness, or[see GM 21.B245, para. 4.2]
  * the Chief of the independent monitoring function of the design assurance system [see 21.B239(a)(3) and AMC 21.B243(a), para.2]

- the personnel making decisions affecting airworthiness and environmental protection:

* compliance verification engineers [see GM 21.B239(a), para.3.1.3]

**3 Kind of statement**

**3.1 Chief Executive**

The Chief Executive should provide the necessary resources for the proper functioning of the design organisation.

A statement of the qualification and experience of the Chief Executive is normally not required.

**3.2 Other management staff**

The person or persons nominated should represent the management structure of the organization and be responsible through the Head of design organisation to the Chief Executive for the execution of all functions as specified in CAR 21, Subpart JB. Depending on the size of the organisation, the functions may be subdivided under individual managers. The nominated managers should be identified and their credentials furnished to DGCA.

The responsibilities and the tasks of each individual manager should be clearly defined, in order to prevent uncertainties about the relations, within the organisation. Responsibilities of the managers should be defined in a way that all responsibilities are covered.

**3.3 Personnel making decisions affecting airworthiness and environmental protection**

For these personnel, no individual statement is required. The applicant should show to DGCA that there is a system to select, train, maintain and identify them for all tasks where they are necessary.

The following guidelines for such a system are proposed:

* These personnel should be identified in the handbook, or in a document linked to the handbook. This, and the corresponding procedures, should enable them to carry out the assigned tasks and to properly discharge associated responsibilities.
* The needs, in terms of quantity of these personnel to sustain the design activities, should be identified by the organisation.
* These personnel should be chosen on the basis of their knowledge, background and experience.
* When necessary, complementary training should be established, to ensure sufficient background and knowledge in the scope of their authorization. The minimum standards for new personnel to qualify in the functions should be established. The training should lead to a satisfactory level of knowledge of the procedures relevant for the particular role.
* Training policy forms part of the design assurance system and its appropriateness forms part of investigation by DGCA within the organisation approval process and subsequent surveillance of persons proposed by the organisation.

* This training should be adapted in response to experience gained within the organization
* The organisation should maintain a record of these personnel which includes details of the scope of their authorisation. The personnel concerned should be provided with evidence of the scope of their authorisation.
* The following minimum information should be kept on record:

  a) Name
  b) Date of birth
  c) Experience and training
  d) Position in organisation
  e) Scope of the authorisation
  f) Date of first issue of the authorisation
  g) If appropriate, date of expiry of the authorisation
  h) Identification number of the authorisation.

  The record may be kept in any format and should be controlled.
* Persons authorised to access the system should be maintained at a minimum to ensure that records cannot be altered in an unauthorised manner or that such confidential records do not become accessible to unauthorised persons.
* Personnel should be given access to their own record.
* Under the provision of 21.B257 DGCA has a right of access to the data held in such a system.
* The organisation should keep the record for at least two years after a person has ceased employment with the organisation or withdrawal of the authorisation, whichever is the sooner.

**GM 21.B245Requirements for Approval**

**1. General**

The data submitted in accordance with 21.B243 should show that sufficient skilled personnel are available and suitable technical and organizational provisions have been made for supporting the Type Investigation defined by AMC 21.B239(a), sub-paragraph 2.3.

**2. Personnel**

The applicant should show that the personnel available to comply with 21.B245 (a), are, due to their special qualifications and number, able to provide assurance of the design or modification of a part or appliance as well as the compilation of all data needed to meet the applicable airworthiness requirements while taking into account the present state of the art and new experience.

**3. Technical**

The applicant should have access to -

a. Workshops and production facilities which are suitable for manufacturing prototype models and test specimens.

b. Accommodation and test facilities which are suitable for carrying out tests and measurements, needed to demonstrate compliance with the airworthiness requirements. The test facilities may be subjected to additional technical conditions related to the nature of tests performed.

**4. Organisation**

The data submitted in accordance with CAR 21.B243 should show that –

4.1 The Head of the Design Organisation for which an application for approval has been made, has the direct or functional responsibility for all departments of the Organisation which are responsible for the part or appliance. If the departments responsible for design are functionally linked, the Head of the Design Organisation still carries the ultimate responsibility for compliance of the Organisation with CAR-21 Subpart JB.

4.2 An Office of Airworthiness has been established and staffed on a permanent basis to act as the focal point for coordinating airworthiness matters; it reports directly to the Head of the Design Organisation or is integrated into an independent quality assurance organisation reporting to the Head of the Design Organisation.

4.3 An Office of Design has been established within the design organisation and staffed on a permanent basis to handle all design related activities that are required to be carried out in terms of the parts and appliances that the design organisation develop/ intends to develop. The Chief of the office of design has the functional responsibility of the office of design and reports directly to the Head of the design organisation.

4.4 Responsibilities for all tasks which support Type Investigation are assigned in such a way that gaps in authority are excluded.

4.5 The responsibility for a number of tasks as in sub-paragraph 4.4 may be assigned to one person especially in the case of simple projects.

**GM 21.B247Significant changes in the design assurance system**

In addition to a change in ownership (see 21.B249), the following changes to the design assurance system should be considered as "significant" to the demonstration of compliance or to the airworthiness or environmental protection of the products:

**1 Organisation**

* Relocation to new premises

* Change in the industrial organisation (partnership, suppliers, design work sharing) unless it can be shown that the independent checking function of the demonstration of compliance is not affected
* Change in the parts of the organisation that contribute directly to the airworthiness or environmental protection (independent checking function, office of airworthiness [or equivalent])
* Change to the independent monitoring principles (see 21.B239(a)(3))

**2 Responsibilities**

* Change of the management staff
  - the Head of the design organisation
  - the Chief of Design
  - the Chief of the Office of Airworthiness
  - the Chief of the independent monitoring function of the design assurance system
* New distribution of responsibilities affecting airworthiness or environmental protection.

**3 Procedures**

Change to the principles of procedures related to:

- the type certification
- the proposal of classification of changes and repairs and obtaining approval of " major
- continued airworthiness (see 21.3A)
- the configuration control, when airworthiness or environmental protection is affected
- the acceptability of design tasks undertaken by partners or subcontractors.

**4 Resources**

* Substantial reduction in number and/or experience of staff (see 21.B245(a)).

**GM 21.B249Transferability**

Transfer of the approval would normally only be agreed in cases where the Organisation itself remains substantially unchanged.

An acceptable transfer situation could be for example a change of company name but with no changes to site address or Chief Executive. However, if the same legal entity were to relocate to new premises with a new Chief Executive and/or new departmental heads, then a substantial investigation by DGCA would be necessary such that the change would be classified as a re-approval.

In the event of receivership there may be good technical justification for continuation of the approval provided that the company continues to function in a satisfactory manner. It is likely that at a later stage the approval might be surrendered by the receiver or transferred to another legal entity in which case the former paragraphs apply.

**GM 21.B251Terms of Approval**

1. The Terms of Approval are stated on the Certificate of Approval issued by DGCA. The certificate states the scope of work with the appropriate limitations for which the approval has been granted.
2. Approval of a change in the Terms of Approval in accordance with CAR 21.B253 will be confirmed by an appropriate amendment of the Certificate of Approval.

3. The certificate references the handbook of the approved Design Organisation, provided in accordance with CAR 21.B243. This handbook defines the tasks which may be performed under the approval.

4. Scopes of work are, for example, "wings" "fuselages" "undercarriages" "engine turbines". Technologies are quoted in the scope of work when it is considered by the DGCA as a limitation for the Design Organisation Approval.

**GM 21.B258 (a)(1)Examples of level one finding**

Examples of level one finding are non-compliances with any of the following paragraphs, that could lower the safety standard and hazards seriously the safety of the aircraft:

21.B239, 21.B245, 21.B247, 21.B251, 21.B265(a) and (b).

It should be anticipated that a non-compliance with these paragraphs is only considered a level one finding when objective evidence has been found that this finding is a non-compliance that could affect the safety of the aircraft.

In addition, the failure to arrange for investigations under 21.B257, in particular to obtain access to facilities, after denial of one written request should be classified as a level one finding.

**AMC 21.B265 (a)Administration of the Handbook (Acceptable Means of Compliance)**

1. The Handbook of the Applicant should be in English language.

2. The Handbook should be produced in a concise form with sufficient information to meet CAR 21.B243 relevant to the scope of approval sought by the applicant. The Handbook should include the following:

a. Organisation name, address, telephone, telex, facsimile numbers and e-mail address.
b. Document title, and company document reference No (if any).
c. Amendment or revision standard identification for the document.
d. Amendment or revision record sheet.
e. List of effective pages with revision/date/amendment identification for each page.
f. Contents list or index.
g. A distribution list for the Handbook.
h. An introduction, or foreword, explaining the purpose of the document for the guidance of the organisation's own personnel. Brief general information concerning the history and development of the organisation and, if appropriate, relationships with other organisations which may form part of a group or consortium, should be included to provide background information for DGCA
i. DGCA Certificate of Approval should be reproduced in the document.
j. Identification of the department responsible for administration of the Handbook.

**Note:** In the case of an initial or revised approval it is recognised that certificate will be issued after DGCA agreement to the Handbook content in draft form. Arrangements for formal publication in a timely manner must be agreed before the certificate of approval is issued.

3. An updating system should be clearly laid down for carrying out required amendments and modifications to the handbook.

4. The handbook may be completely or partially integrated into the quality assurance handbooks of the organisation to be approved. In this case, identification of the information required by CAR 21.B243 should be provided by giving appropriate cross references, and these documents should be made available, on request to DGCA

**GM 21.B265 (b) Use of the Handbook**

1. The handbook should be signed by the Chief Executive and the Head of the Design Organisation and declared as a binding instruction for all personnel charged with the development and type investigation of products.

2. All procedures referenced in the handbook are considered as parts of the handbook and therefore as basic working documents.

# Subpart K – Parts and appliances

**AMC to 21.303(c) Standard Parts**

In this context a part is considered as a "standard part":

1. Where it is designated as such by the design approval holder responsible for the product, part or appliance, in which the part is intended to be used. In order to be considered a "standard part", all design, manufacturing, inspection data and marking requirements necessary to demonstrate conformity of that part should be in the public domain and published or established as part of officially recognised Standards, or
2. For sailplanes and powered sailplanes, where it is a non-required instrument and/or equipment certified under the provision of CS 22.1301(b)/ applicable airworthiness code, if that instrument or equipment, when installed, functioning, functioning improperly or not functioning at all, does not in itself, or by its effect upon the sailplane and its operation, constitute a safety hazard.

   "Required" in the term "non-required" as used above, means required by the applicable airworthiness code (CS 22.1303, 22.1305 and 22.1307) or required by the relevant operating regulations and the applicable Indian Aircraft Rules or as required by Air Traffic Management (e.g. a transponder in certain controlled airspace).

   Examples of equipment which can be considered standard parts are electrical variometers, bank/slip indicators (ball type), total energy probes, capacity bottles (for variometers), final glide calculators, navigation computers, data logger / barograph /turn-point camera, bug-wipers and anti-collision systems, etc.

   Equipment which must be approved in accordance to the airworthiness code shall comply with the applicable ITSO or equivalent and is not considered a standard part (e.g. oxygen equipment).

**GM 21.303(c) Officially recognised Standards**

In this context "officially recognised Standards" means:

1. Those standards established or published by an official body whether having legal personality or not, which are widely recognised by the air transport sector as constituting good practice; or
2. The standard used by the manufacturer of the equipment as mentioned in paragraph 2 of AMC 21.303(c).

# Subpart L – Not applicable

# Subpart M – Repairs

**GM 21.431(a) Scope**

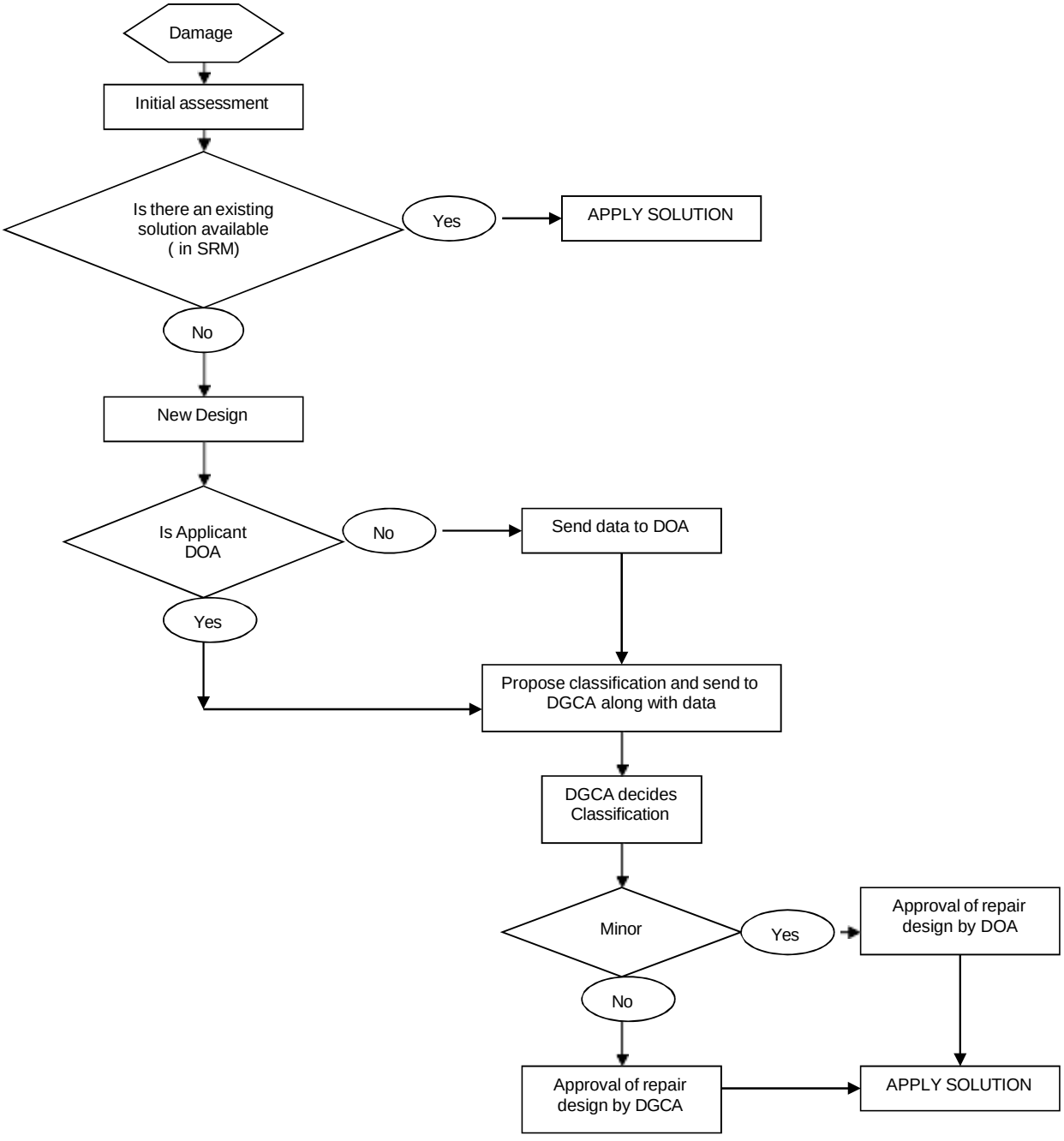
Manuals and other instructions for continued airworthiness (such as the Manufacturers Structural Repair Manual, Maintenance Manuals, Engine Manuals and Propeller Manuals provided by the holder of the type certificate, supplemental type-certificate, or APU ITSO authorisation as applicable) for operators, contain useful information for the development and approval of repairs.

When these data are explicitly identified as approved, they may be used by operators without further approval to cope with anticipated in-service problems arising from normal usage provided that they are used strictly for the purpose for which they have been developed.

Approved data is data which is approved either by DGCA, or by an appropriately approved design organisation under the privilege granted by DGCA.

Note: Flow chart given below addresses procedure that should be followed for products

**OPERATOR**


Damage
Initial assessment
Is there an existing solution available ( in SRM)
Yes
APPLY SOLUTION
No
New Design
Is Applicant DOA
No
Send data to DOA
Yes
Propose classification and send to DGCA along with data
DGCA decides Classification
Minor
Yes
Approval of repair design by DOA
No
Approval of repair design by DGCA
APPLY SOLUTION

When specific repair data is approved outside of the Country, conditions for acceptance may be defined in the bilateral arrangements between India and Regulatory Authority of a third country. In the absence of such arrangement, the repair data shall follow the approval route as if it was designed and approved within the Country.

**GM 21.431(d) Repairs to ITSO articles other than an APU**

A repair to an ITSO article other than an APU can be either seen:

1. Under 21.611 in the context of an ITSO authorisation, i.e., when an article as such is specifically approved under Subpart O, with dedicated rules that give specific rights and obligations to the designer of the article, irrespective of any product type design or change to the type design. For a repair to such an article, irrespective of installation on any aircraft, Subpart O, and 21.611in particular, should be followed.; or
2. When an airline or a maintenance organisation is designing a new repair (based on data not published in the TC holder or Original Equipment Manufacturer (OEM) documentation) on an article installed on an aircraft, such a repair can be considered as a repair to the product in which the article is installed, not to the article taken in isolation. Therefore Subpart M can be used for the approval of this repair, that will be identified as "repair to product x affecting article y", but not "repair to article y".

**AMC 21.433(a) and 21.447Repair design and Record Keeping**

1. Relevant substantiation data associated with a new major repair design and record keeping should include:
   a. damage identification and reporting source,
   b. major repair design approval sheet identifying applicable requirements and references of justifications,
   c. repair drawing and/or instructions and scheme identifier,
   d. correspondence with the TC, STC, or APU ITSO authorization holder, if its advice on the design has been sought,
   e. structural justification (static strength, fatigue, damage tolerance, flutter etc ) or references to this data,
   f. effect on the aircraft, engines and/or systems, (performance, flight handling, etc as appropriate)
   g. effect on maintenance programme,
   h. effect on Airworthiness limitations, the Flight Manual and the Operating Manual,
   i. weight and moment change,
   j. special test requirements.

2. Relevant minor repair documentation includes paragraphs 1(a) and (c). Other points of paragraph 1 may be included where necessary. If the repair is outside the approved data, justification for classification is required.

3. Special consideration should be given to repairs that impose subsequent limitations on the part, product or appliance, (e.g., engine turbine segments that may only be repaired a finite number of times, number of repaired turbine blades per set, oversizing of fastener holes, etc.).

4. Special consideration should also be given to Life Limited parts and Critical Parts, notably with the involvement of the type-certificate or STC holder, when deemed necessary under 21.433 (b).

5. Repairs to engine critical parts would normally only be accepted with the involvement of the TC holder.

**GM 21.435(a) Classification of repairs**

**1. Clarification of the terms Major/Minor**

In line with the definitions given in 21.91, a new repair is classified as 'major' if the result on the approved type design has an appreciable effect on structural performance, weight, balance, systems, operational characteristics, noise, fuel venting, exhaust emission regulations or other characteristics regulations affecting the airworthiness of the product, part or appliance. In particular, a repair is classified as major if it needs extensive static, fatigue and damage tolerance strength justification and/or testing in its own right, or if it needs methods, techniques or practices that are unusual (i.e., unusual material selection, heat treatment, material processes, jigging diagrams, etc.)

Repairs that require a re-assessment and re-evaluation of the original certification substantiation data to ensure that the aircraft still complies with all the relevant requirements, are to be considered as major repairs.

Repairs whose effects are considered minor and require minimal or no assessment of the original certification substantiation data to ensure that the aircraft still complies with all the relevant requirements, are to be considered "minor".

It is understood that not all the certification substantiation data will be available to those persons/organisations classifying repairs. A qualitative judgment of the effects of the repair will therefore be acceptable for the initial classification. The subsequent review of the design of the repair may lead to it being re-classified, owing to early judgments being no longer valid.

**2. Airworthiness concerns for Major/Minor classification**

The following should be considered for the significance of their effect when classifying repairs. Should the effect be considered to be significant then the repair should be classified 'Major'. The repair may be classified as 'Minor' where the effect is known to be without appreciable consequence.

i) Structural performance
Structural performance of the product includes static strength, fatigue, damage tolerance, flutter and stiffness characteristics regulations. Repairs to any element of the structure should be assessed for their effect upon the structural performance.

ii) Weight and balance
The weight of the repair may have a greater effect upon smaller aircraft as opposed to larger aircraft. The effects to be considered are related to overall aircraft centre of gravity and aircraft load distribution. Control surfaces are particularly sensitive to the changes due to the effect upon the stiffness, mass distribution and surface profile which may have an effect upon flutter characteristics regulations and controllability.

iii) Systems
Repairs to any elements of a system should be assessed for the effect intended on the operation of the complete system and for the effect on system redundancy. The consequence of a structural repair on an adjacent or remote system should also be considered as above, (for example: airframe repair in area of a static port).

iv) Operational characteristics regulations
Changes may include:
- stall characteristics regulations
- handling
- performance and drag
- vibration

v) Other characteristics regulations
- changes to load path and load sharing
- change to noise and emissions
- fire protection / resistance

**Note:** Considerations for classifying repairs 'Major/Minor' should not be limited to those listed above.

**3. Examples of 'Major' repairs**

i) A repair that requires a permanent additional inspection to the approved maintenance programme, necessary to ensure the continued airworthiness of the product. Temporary repairs for which specific inspections are required prior to installation of a permanent repair do not necessarily need to be classified as 'Major'. Also, inspections and changes to inspection frequencies not required as part of the approval to ensure continued airworthiness do not cause classification as 'Major' of the associated repair.

ii) A repair to life limited or critical parts.

iii) A repair that introduces a change to the Aircraft Flight Manual.

**GM 21.437Issue of repair design approval**

1) Approval by DOA holder
Approval of repairs through the use of procedures agreed with DGCA, means an approval issued by the DOA holder without requiring DGCA involvement. DGCA will monitor application of this procedure within the surveillance plan for the relevant organisation. When the organisation exercises this privilege, the repair release documentation should clearly show that the approval is under their DOA privilege.

2) Previously approved data for other applications
When it is intended to use previously approved data for other applications, it is expected that applicability and effectiveness would be checked with an appropriately approved design organisation. After damage identification, if a repair solution exists in the available approved data, and if the application of this solution to the identified damage remains justified by the previous approved repair design, (structural justifications still valid, possible airworthiness limitations unchanged), the solution can be considered approved and can be used again.

3) Temporary repairs.
These are repairs that are life limited, to be removed and replaced by a permanent repair after a limited service period. These repairs should be classified under 21.435 and the service period defined at the approval of the repair.

4) Fatigue and damage tolerance.
When the repaired product is released into service before the fatigue and damage tolerance evaluation has been completed, the release should be for a limited service period, defined at the issue of the repair.

**GM 21.437(a)Issue of repair design approval**

1) Products first type-certificated by DGCA

i) DGCA approval is required in cases of major repairs proposed by design organization approval holders, not being the TC, STC or APU ITSO authorization holder, and in cases of minor repairs proposed by persons not holding a design organisation approval.

ii) DGCA approval is required in cases of major repairs proposed by design organisation approval holders, being the TC, STC or APU ITSO authorization holder, if the major repair is:

- related to new interpretation of the airworthiness requirement as used for type certification.
- related to different means of compliance from that used for type certification.
- related to the application of airworthiness requirements different from that used for type certification.

NOTE: This should be established at the time of DOA approval.

2) Products first type-certificated by another country

DGCA approval is always required for major repairs on products first type-certificated by another country. Approval privileges extended to TC holders are not extended to TC holders of products first type-certificated by another country. Type-certificate holders of those types may need to be involved when an arrangement with the TC holder has been determined necessary under 21.433(b).

For repairs approved outside the Country, conditions for acceptance may be defined in the bilateral arrangement between DGCA and the authority of another country. In the absence of such arrangement, the repair data shall follow the approval route as if it was designed and approved within the Country.

**GM 21.439Production of repair parts**

A maintenance body, (organisation or person), may manufacture parts for repair purposes when in accordance with Subpart F or when approved under Subpart G of CAR 21. In addition, a maintenance organisation may manufacture parts for its own repair purposes when expressly authorised by DGCA in accordance with the applicable rules.

**GM 21.441Repair Embodiment**

Repairs should be accomplished by an organisation or person in accordance with the relevant rules.

The holder of a production organisation approval under Subpart G of CAR 21 may accomplish repairs to new aircraft, within its terms of approval, under the privilege of 21.163(d).

**GM 21.443Limitations**

Instructions and limitations associated with repairs should be specified and controlled by those procedures required by the applicable operations rules.

**GM 21.445Un-repaired damage**

This is not intended to supersede the normal maintenance practices defined by the type certificate holder, (e.g., blending out corrosion and re-protection, stop drilling cracks, etc.), but addresses specific cases not covered in the manufacturer's documentation.

# Subpart N – Not applicable

# Subpart O – Indian Technical Standard Order Authorisations (ITSOA)

**AMC 21.602B(c)(2)Procedures for ITSO authorisations**

**1 Scope**

1.1 A manual of procedures must set out specific design practices, resources and sequence of activities relevant for the specific projects, taking account of CAR 21 requirements.

1.2 These procedures must be concise and limited to the information needed for quality and proper control of activities by the applicant/holder, and by DGCA.

**2 Management of the ITSO authorisation process**

A procedure explaining how the application to the DGCA certification process to obtain an ITSOA will be made, must be established.

**3 Management of design changes**

3.1 A procedure taking into account 21.611, must be established for the classification and approval of design changes on articles under ITSO authorisation

3.2 Procedure for the classification and approval of repairs and unintentional deviations from the approved design data occurring in production (concessions or non-conformances) must be established.

**4 Obligations addressed in 21.609**

The applicant should establish the necessary procedures to show to DGCA how it will fulfil the obligations under 21.609.

For issue of information and instructions, a procedure following the principles of AMC 21.14(b), paragraph 4 must be established.

**5 Control of design subcontractors**

The applicant must establish the necessary procedures to show to DGCA how it will control design subcontractors.

**AMC 21.608Declaration of Design and Performance**

STANDARD FORM
DDP No.……...
ISSUE No. ……...

1 Name and address of manufacturer.

2 Description and identification of article including:
Type No ……..
Modification Standard
Master drawing record
Weight and overall dimensions

3 Specification reference, i.e., ITSO No. and Manufacturer's design specification.

4 The rated performance of the article directly or by reference to other documents.

5 Particulars of approvals held for the equipment.

6 Reference to qualification test report.

7 Service and Instruction Manual reference number.

8 Statement of compliance with the appropriate ITSO and any deviations there from.

9 A statement of the level of compliance with the ITSO in respect of the ability of the article to withstand various ambient conditions or to exhibit various properties.

The following are examples of information to be given under this heading depending on the nature of the article and the requirements of the ITSO.

a. Environmental Qualification
- i. Temperature and Altitude
- ii. Temperature Variation
- iii. Humidity
- iv. Operational Shocks and Crash Safety
- v. Vibration
- vi. Explosion Proofness
- vii. Waterproofness
- viii. Fluids Susceptibility
- ix. Sand and Dust
- x. Fungus Resistance
- xi. Salt Spray
- xii. Magnetic Effect
- xiii. Power Input
- xiv. Voltage Spike
- xv. Audio Frequency Conducted Susceptibility - Power Inputs
- xvi. Induced Signal Susceptibility
- xvii. Radio Frequency Susceptibility (Radiated and Conducted)
- xviii. Emission of Radio Frequency Energy
- xix. Lightning Induced Transient Susceptibility
- xx. Lightning Direct Effects
- xxi. Icing

xxii. Electrostatic Discharge
xxiii. Fire, Flammability

(NOTE: The manufacturer should list environmental categories for each of the sections of the issue of EUROCAE ED-14/RTCA DO-160 that was used to qualify the article.)

b. For radio transmitters the transmitting frequency band, maximum transmitting power, and emission designator.

c. Working and ultimate pressure or loads.

d. Time rating (e.g., continuous, intermittent) or duty cycle.

e. Limits of accuracy of measuring instruments.

f. Any other known limitations which may limit the application in the aircraft e.g., restrictions in mounting attitude.

10 A statement of the software level(s) used or "None" if not applicable.

(NOTE: Software levels are those defined in the applicable latest issue of EUROCAE ED–12/RTCA document DO–178.)

11 A statement of design assurance level for complex hardware or a statement indicating whether complex hardware is embedded or not in the product.

(NOTE: Complex hardware design assurance levels are those defined in the applicable latest issue of EUROCAE ED–80/RTCA DO-254.)

12 The declaration in this document is made under the authority of
……(name of manufacturer)
(Manufacturer's name) cannot accept responsibility for equipment used outside the limiting conditions stated above without their agreement.

Date: ……..Signed……(Manufacturer's authorised representative)

**GM to 21A.611Design changes**

A change to an ITSO article can either be seen:
Under this 21.611 in the context of an ITSO authorisation, i.e., when an article as such is specifically approved under Subpart O, with dedicated rules that give specific rights and obligations to the designer of the article, irrespective of any product type design or change to the type design. For a change to such an article, irrespective of installation on any aircraft, Subpart O, and this 21.611in particular, should be followed.

Or

When an airline or a maintenance organisation is designing a change (based on data not published in the TC holder or Original Equipment Manufacturer documentation) on an article installed on an aircraft, such a change can be considered as a change to the product in which the article is installed, not to the article taken in isolation. Therefore Subpart D can be used for the approval of this change that will be identified as "change to product x affecting article y", but not "change to article y".

# Subpart P – Special Flight Permit

**GM 21.701(a) Special Flight Permit when certificate of airworthiness or special certificate of airworthiness is not appropriate**

A certificate of airworthiness or special certificate of airworthiness may not be appropriate for an individual aircraft or aircraft type when it is not practicable to comply with the normal continued airworthiness requirements and the aircraft is to a design standard that is demonstrated to be capable of safe flight under defined conditions. CAR21.701 identifies cases where the issuance of a (Special) Certificate of Airworthiness may not be possible or appropriate and this GM provides further information and typical examples for clarification where appropriate:-

**Note:** This list of examples is not exhaustive

(1) Development:
- testing of new aircraft or modifications
- testing of new concepts of airframe, engine propeller and equipment;
- testing of new operating techniques;

(2) Demonstration of compliance with airworthiness codes:
- certification flight testing for type certification, supplemental type certificates, changes to type certificates or Indian Technical Standard Order authorisation;

(3) Design organisations or production organisations crew training:
- Flights for training of crew that will perform design or production flight testing before the design approval or Certificate of Airworthiness (C of A) can be issued.

(4) Production flight testing of new production aircraft:
- For establishing conformity with the approved design, typically this would be the same program for a number of similar aircraft;

(5) Flying aircraft under production between production facilities:
- green aircraft ferry for follow on final production.

(6) Flying the aircraft for customer acceptance:
- Before the aircraft is sold and/or registered.

(7) Delivering or exporting the aircraft:
- Before the aircraft is registered in the State where the C of A will be issued.

(8) Flying the aircraft for Authority acceptance:
- In the case of inspection flight test by the authority before the C of A is issued.

(9) Market survey, including customer's crew training:
- Flights for the purpose of conducting market survey, sales demonstrations and customer crew training with non type certificated aircraft or aircraft for which conformity has not yet been established or for non-registered a/c and before the Certificate of Airworthiness is issued

(10) Exhibition and air show:
- Flying the aircraft to an exhibition or show and participating to the exhibition or show before the design approval is issued or before conformity with the approved design has been shown.

(11) Flying the aircraft to a location where maintenance or airworthiness review are to be performed, or to a place of storage:
- Ferry flights in cases where maintenance is not performed in accordance with approved programmes, where an AD has not been complied with where certain equipment outside the Master Minimum Equipment List (MMEL) is unserviceable or when the aircraft has sustained damage beyond the applicable limits.

(12) Flying an aircraft at a weight in excess of its maximum certificated take-off weight for flight beyond the normal range over water, or over land areas where adequate landing facilities or appropriate fuel is not available:
- Oversees ferry flights with additional fuel capacity.

(13) Record breaking, air racing or similar competition:
- Training flight and positioning flight for this purpose are included

(14) Flying aircraft meeting the applicable airworthiness requirements before conformity to the environmental requirements has been found:
- Flying an aircraft which has been shown to comply with all applicable airworthiness requirements but not with environmental requirements.

(15) For non-commercial flying activity on individual non-complex aircraft or types for which a certificate of airworthiness or special certificate of airworthiness is not appropriate.
- For aircraft which cannot practically meet all applicable airworthiness requirements, such as certain aircraft without TC-holder or aircraft which have been under national systems of Special Flight Permit and have not been shown to meet all applicable requirements. The option of a Special Flight Permit for such an aircraft should only be used if a certificate of airworthiness or special certificate of airworthiness cannot be issued due to conditions which are outside the direct control of the aircraft owner, such as the absence of properly certified spare parts.

**Note:** The above listing is of cases when a Special Flight Permit MAY be issued; it does not mean that in the described cases a Special Flight Permit MUST be issued. If other legal means are available to allow the intended flight(s) they can also be used.

**GM 21.701Scope**

An aircraft registered outside India and used for flight testing by an organisation which has its principle place of business in India, remains under the authority of its state of registry. DGCA or TC holder of that aircraft can provide, on request, technical assistance to the state of registry for the issue of a Special Flight Permit, or equivalent authorisation, under the state of registry applicable regulations.

**GM 21.703Applicant for a Special Flight Permit**

1. The applicant for a Special Flight Permit may be a person other than the registered owner of the aircraft. As the holder of this permit will be responsible for ensuring that all the conditions and limitations associated with the Special Flight Permit are continuously satisfied, the applicant for the permit should be a person or organisation suitable for assuming these responsibilities. In particular, the organisations designing, modifying or maintaining the aircraft should normally be the holder of the associated permits to fly.

2. An appropriately approved design organisation can apply for the approval of the flight conditions when using its privilege in accordance with 21.A263(b)(1).

**AMC 21.707Application for a Special Flight Permit**

DGCA must receive an application form for Special Flight Permit (see below) completed by the applicant.

| Application for Special Flight Permit | | |
|---|---|---|
| 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<br>*[Use terminology of 21.701(a) and add any additional information for accurate description of the purpose, e.g. place, itinerary, duration…]*<br>*[For an application due to a change of purpose (ref. 21.713):reference to initial request and description of new purpose]* | | |
| 7. Expected target date(s) for the flight(s) and duration | | |
| 8. Aircraft configuration as relevant for the Special Flight Permit<br>8.1 The above aircraft for which a Special Flight Permit is requested is defined in *[add reference to the document(s) identifying the configuration of the aircraft. Same as required in AMC 21.A263(c)(6) or AMC 21.709(b) application form, box 5]*<br>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]*<br><br>*[Reference to:. DGCA approval* | | |
| 10. Date | | 11. Name and signature<br>*[Authorised signatory]* |

**GM 21.708(b)(6)Continuing airworthiness**

In most cases a simple reference to existing maintenance requirements will suffice for aircraft that have a temporarily invalid C of A.
For other aircraft it will have to be proposed by the applicant as part of the flight conditions. For approved organisations they can be included in their procedures.

**GM No. 1 to 21.708(c)Safe flight**

Safe flight normally means continued safe flight and landing but in some limited cases (e.g. higher risk flight testing) it can mean that the aircraft is able to fly in a manner that will primarily ensure the safety of over flown third parties, the flight crew and, if applicable other occupants.

This definition of "safe flight" should not be interpreted as allowing a test pilot, equipped with a parachute and operating over a sparsely populated area, to set out on a test flight in the full knowledge that there is a high probability of losing the aircraft. The applicant should take reasonable care to minimise safety risks and to be satisfied that there is a reasonable probability that the aircraft will carry out the flight without damage or injury to the aircraft and its occupants or to other property or persons whether in the air or on the ground.

**GM No. 2 to 21.708(c) Substantiations**

The substantiations should include analysis, calculations, tests or other means used to determine under which conditions or restrictions the aircraft can perform safely a flight.

**GM 21.708(d) Control of aircraft configuration**

The applicant should establish a method for the control of any change or repair made to the aircraft, for changes and repairs that do not invalidate the conditions established for the Special Flight Permit.

All other changes should be approved in accordance with 21.713 and when necessary a new Special Flight Permit should be issued in accordance with 21.711.

**AMC 21.709(b) Submission of documentation supporting the establishment of flight conditions**

Together with the application, the documentation required by 21.709(b) must be submitted, completed with all relevant information. If the complete set of data is not available at the time of application, the missing elements can be provided later. In such cases, the approval form (as given below) must be provided only when all data are available, to allow the applicant to make the statement required in box 8 of the form.

| FLIGHT CONDITIONS FOR A SPECIAL FLIGHT PERMIT – APPROVAL FORM | |
|---|---|
| 1. Applicant<br>*[Name of organisation providing the flight conditions and associated substantiations]* | 2. Approval form number.<br>Issue:<br>*[number and issue, for traceability purpose]* |
| 3. Aircraft manufacturer/type | 4. Serial number(s) |
| 5. Purpose<br><br>[Purpose in accordance with 21.701(a)] | |
| 6. Aircraft configuration<br>The above aircraft for which a Special Flight Permit is requested is defined in *[add reference to the document(s) identifying the configuration of the aircraft]*<br>*[For change(s) affecting the initial approval form: description of change(s). This form must be re-issued]* | |
| 7. Substantiations<br>*[References to the document(s) justifying that the aircraft (as described in 5.) can perform the intended flight(s) safely under the defined conditions or restrictions.]*<br>*[For change(s) affecting the initial approval form: reference(s) to additional substantiation(s). This form must be re-issued]* | |
| 8. Conditions/Restrictions<br>The above aircraft must be used with the following conditions or restrictions:<br>*[Details of these conditions/restrictions, or reference to relevant document, including specific maintenance instructions and conditions to perform these instructions)* | |
| 9. Statement<br>The flight conditions have been established and justified in accordance with 21.708.<br>The aircraft as defined in block 6 above has no features and characteristics making it unsafe for the intended operation under the identified conditions and restrictions. | |
| 10. Date of issue | 11. Name and signature<br>*[Authorised signatory]* |

**GM 21.710Approval of flight conditions**

1. The following flight conditions are not considered acceptable as related to the safety of design:

   a. the aircraft does not conform to an approved design; or
   b. an Airworthiness Limitation, a Certification Maintenance Requirement or an Airworthiness Directive has not been complied with; or
   c. the intended flight(s) are outside the approved envelope;
   d. the Special Flight Permit is proposed beyond the purpose of 21.701

2. Examples when the approval of flight conditions is not related to the safety of the design are:

   a. production flight testing for the purpose of conformity establishment;
   b. delivery / export flight of a new aircraft the design of which is approved;
   c. demonstrating continuing conformity with the standard previously accepted by DGCA for the aircraft or type of aircraft to qualify or re-qualify for a (Special) certificate of airworthiness.

**GM 21.711(d) Additional conditions and restrictions**

The conditions and restrictions prescribed by DGCA may include airspace restrictions to make the conditions approved under 21.710 more concrete, or conditions outside the scope of the ones mentioned in 21.708(b) such as a radio station license.

**GM 21.713Changes**

Changes to the conditions or associated substantiations that are approved but do not affect the text on the Special Flight Permit do not require issuance of a new Special Flight Permit.
In case a new application is necessary, the substantiation for approval of the flight conditions only needs to address the change.

**GM 21.719Transfer of a Special Flight Permit**

Except for Special Flight Permits issued under 21.701(a)(15), like aircraft without TC holder, a Special Flight Permit is issued based upon the applicant's declaration of many aspects of the proposed flight or flights, some of which are specific to the applicant. Accordingly, the basis upon which a Special Flight Permit has been issued necessarily is no longer fully in place when the holder of a Special Flight Permit changes, ownership changes, and/or there is a change of register. Such changes necessitate a new application under 21.707.

# Subpart Q – Identification of products, parts and appliances

**GM 21.804(a) (1) Identification of parts and appliances**

It is not the intent of 21.804(a) (1) to introduce an obligation for a production organisation (manufacturer) to mark new parts or appliances with information which is not identified by the design approval holder. Therefore, the physical marking of parts and appliances is only required when established by the design approval (TC, STC, ITSO, repair, minor change) holder.

The design approval holder is required to identify to the manufacturer how the marking in accordance with 21.804(a) (1)should be done. This can be limited to identifying a marking field, possible depth and/or means etc., without prescribing the actual text or symbols to be used.

# APPENDICES - DGCA FORMS
# Under CAR 21

| 1. DGCA, India | **AUTHORISED RELEASE CERTIFICATE<br>FORM CA-1** | 3. Form Tracking Number |
|---|---|---|
| 4. Approved Organisation Name and Address: | | 5. Work Order/Contract/Invoice |

| 6. Item | 7. Description | 8. Part No | | 9. Quantity | 10. Serial/Batch No | 11. Status/Work |
|---|---|---|---|---|---|---|
| | | | | | | |

12. Remarks

| 13a Certifies that the items identified above were manufactured in conformity to:<br><br>□ approved design data and are in condition for safe operation<br>□ non-approved design data specified in block 12 | 14a. □ CAR-145..50 Release to Service □ Other regulation specified in block 12<br><br>Certifies that unless otherwise specified in block12, the work identified in block 11and described in block 12 was accomplished in accordance with CAR-145 and in respect to that work the items are considered ready for release to service. |
|---|---|

| 13b Authorised Signature | 13c. Approval/ Authorisation Number | 14b. Authorised Signature | 14c. Certificate/Approval Ref. No |
|---|---|---|---|
| 13d. Name | 13e. Date (d/m/y) | 14d Name | 14e. Date (d/m/y) |

User/Installer Responsibilities

THIS CERTIFICATE DOES NOT AUTOMATICALLY CONSTITUTE AUTHORITY TO INSTALL THE ITEM . 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

(*) Installer must cross-check eligibility with applicable technical data

**FORM CA-1 - AUTHORISED RELEASE CERTIFICATE**

## COMPLETION INSTRUCTIONS

These instructions relate only to the use of Form CA-1 for manufacturing purposes. Attention is drawn to Appendix 3 to Car 145 which covers the use of Form CA-1 for maintenance purposes.

### 1. PURPOSE AND SCOPE

1.1. A primary purpose of the certificate is to declare the airworthiness of new aviation products, parts and appliances (hereafter referred to as 'item (s)').

1.2. Correlation must be established between the certificate and the item(s). The originator must retain a certificate in a form that allows verification of the original data.

1.3. The certificate is acceptable to many airworthiness authorities, but may be dependent on bilateral agreements and/or the policy of the airworthiness authority. The 'approved design data' mentioned in this certificate then means approved by the airworthiness authority of the importing country.

1.4. The certificate is not a delivery or shipping note.

1.5. Aircraft are not to be released using the certificate.

1.6. The certificate does not constitute approval to install the item on a particular aircraft, engine, or propeller but helps the end user determine its airworthiness approval status.

1.7. A mixture of production released and maintenance released items is not permitted on the same certificate.

1.8. A mixture of items certified in conformity with 'approved data' and to 'non-approved data' is not permitted on the same certificate.

### 2. GENERAL FORMAT

2.1 The Certificate must comply with the format attached including block numbers and the location of each Block. The size of each Block may however be varied to suit the individual application, but not to the extent that would make the Certificate unrecognisable.

2.2. The certificate must be in 'landscape' format but the overall size may be significantly increased or decreased so long as the certificate remains recognisable and legible. If in doubt consult the DGCA

2.3. The User/Installer responsibility statement can be placed on either side of the form.

2.4. All printing must be clear and legible to permit easy reading.

2.5. The certificate may either be pre-printed or computer generated but in either case the printing of lines and characters must be clear and legible and in accordance with the defined format.

2.6. The certificate should be in English, and if appropriate, in one or more other languages.

2.7. The details to be entered on the certificate may be either machine/- computer printed or hand-written using block letters and must permit easy reading.

2.8. Limit the use of abbreviations to a minimum, to aid clarity.

2.9. The space remaining on the reverse side of the certificate may be used by the originator for any additional information but must not include any certification statement. Any use of the reverse side of the certificate must be referenced in the appropriate block on the front side of the certificate.

## 3. COPIES

3.1. There is no restriction in the number of copies of the certificate sent to the customer or retained by the originator.

## 4. ERROR(S) ON A CERTIFICATE

4.1. If an end-user finds an error(s) on a certificate, he must identify it/them in writing to the originator. The originator may issue a new certificate if they can verify and correct the error(s

4.2. The new certificate must have a new tracking number, signature and date.

4.3. The request for a new certificate may be honoured without re-verification of the item(s) condition. The new certificate is not a statement of current condition and should refer to the previous certificate in block 12 by the following statement: 'This certificate corrects the error(s) in block(s) [enter block(s) corrected] of the certificate [enter original tracking number] dated [enter original issuance date] and does not cover conformity/condition/release to service'. Both certificates should be retained according to the retention period associated with the first.

## 5 COMPLETION OF THE RELEASE CERTIFICATE BY THE ORIGINATOR

Except as otherwise stated, there must be an entry in all Blocks to make the document a valid certificate.

Block 1 Pre-printed 'DGCA, India'

Block 2 Pre-printed 'Authorised Release Certificate/CA Form l'.

Block 3 Form Tracking Number

Enter the unique number established by the numbering system/procedure of the organisation identified in block 4; this may include alpha/numeric characters.

Block 4 Organisation Name and Address

Enter the full name and address of the production organisation (refer to CAR Form 55 Sheet A) releasing the item(s) covered by this certificate. Logos etc. of the organisation are permitted if they can be contained within the block.

The information in this Block needs to satisfy two objectives:

1. to relate the Certificate to an organisation approval, for the purposes of verifying authenticity and authority of the Certificate:
2. to provide a ready means of rapidly identifying the place of manufacture and release, to facilitate traceability and communication in the event of problems or queries.

Therefore, the name entered in the box is that of the organisation approval holder who is responsible for making the final determination of conformity or airworthiness, and whose Approval Reference Number is quoted in Block 16. The name must be entered in exactly the same form as appears in the Approval Certificate held by the organisation.

The address(es) entered in Block 4 will assist in the identification of the approval holder AND in identifying the place of release.

If the place of manufacture and release is one of the organisation addresses listed on the Approval Certificate, then that is the only address needed in this Block.
If the place of manufacture and release is a location which is NOT listed in the Approval Certificate then two addresses are required. The first address will be the address of the approval holder (as listed in the Approval Certificate) and a second address entered to identify the place of manufacture and release.

Block 5 Work Order/Contract/Invoice

To facilitate customer traceability of the item(s), enter the work order number, contract number, invoice number, or similar reference number

Block 6 Item
Enter line item numbers when there is more than one line item. This block permits easy cross-referencing to the Remarks block 12.
.

Where a number of items are to be released on the Certificate. it is permissible to use a separate listing cross-referring Certificate and list to each other.

Block 7 Description
Enter the name or description of the item. Preference should be given to the term used in the instructions for continued airworthiness or maintenance data (e.g. Illustrated Parts Catalogue, Aircraft Maintenance Manual, Service Bulletin, Component Maintenance Manual).

Block8 Part Number
Enter the part number as it appears on the item or tag/packaging. In case of an engine or propeller the type designation may be used

Block 9 Quantity
State the quantity of items

Block 10 Serial Number

If the item is required by regulation to be identified with a serial number, enter it here. Additionally, any other serial number not required by regulation may also be entered. If there is no serial number identified on the item, enter 'N/A'.

Block 11 Status/Work

Enter either 'PROTOTYPE' or 'NEW'.
Enter 'PROTOTYPE' for:
(i) The production of a new item in conformity with non-approved design data.

(ii) Re-certification by the organisation identified in block 4 of the previous certificate after alteration or rectification work on an item, prior to entry into service, (e.g. after incorporation of a design change, correction of a defect, inspection or test, or renewal of shelf-life.) Details of the original release and the alteration or rectification work are to be entered in block 12.

Enter 'NEW' for:

(i) The production of a new item in conformity with the approved design data.

(ii) Re-certification by the organisation identified in block 4 of the previous certificate after alteration or rectification work on an item, prior to entry into service, (e.g. after incorporation of a design change, correction of a defect, inspection or test, or renewal of shelf-life.) Details of the original release and the alteration or rectification work are to be entered in block 12.
(iii) Re-certification by the product manufacturer or the organisation identified in block 4 of the previous certificate of items from 'prototype' (conformity only to non-approved data) to 'new' (conformity to approved data and in a condition for safe operation), subsequent to approval of the applicable design data, provided that the design data has not changed. The following statement must be entered in block 12:

RE-CERTIFICATION OF ITEMS FROM 'PROTOTYPE' TO 'NEW': THIS DOCUMENT CERTIFIES THE APPROVAL OF THE DESIGN DATA [INSERT TC/STC NUMBER, REVISION LEVEL], DATED [INSERT DATE IF NECESSARY FOR IDENTIFICATION OF REVISION STATUS], TO WHICH THIS ITEM (THESE ITEMS) WAS (WERE) MANUFACTURED.

The box 'approved design data and are in a condition for safe operation' should be marked in block 13a.

(iv) The examination of a previously released new item prior to entry into service in accordance with a customer-specified standard or specification (details of which and of the original release are to be entered in block 12) or to establish airworthiness (an explanation of the basis of release and details of the original release are to be entered in block 12).

Block 12 Remarks

Describe the work identified in block 11, either directly or by reference to supporting documentation, necessary for the user or installer to determine the airworthiness of item(s) in relation to the work being certified. If necessary, a separate sheet may be used and referenced from the CA Form 1. Each statement must clearly identify which item(s) in block 6 it relates to. If there is no statement, state 'None'.

Enter the justification for release to non-approved design data in block 12 (e. g. pending type-certificate, for test only, pending approved data).

If printing the data from an electronic Form CA-1 any data not appropriate in other blocks should be entered in this block..

Block 13a

Mark only one of the two boxes:

1. Mark the 'approved design data and are in a condition for safe operation' box if the item(s) were manufactured using approved design data and found to be in a condition for safe operation.

2. Mark the 'non-approved design data specified in block 12' box if the item (s) were manufactured using applicable non-approved design data. Identify the data in block 12 (e.g. pending type-certificate, for test only, pending approved data). Mixtures of items released against approved and non-approved design data are not permitted on the same certificate.

Block 13b Authorised Signature

This space shall be completed with the signature of the authorised person. Only persons specifically authorised are permitted to sign this block. To aid recognition, a unique number identifying the authorised person may be added.

The hand-written normal signature of a person who has written authority from an approved production organisation to make Certifications in respect of new items. Use of a stamp instead of a signature is not permitted, but the authorised person may add a stamp impression to his or her signature to aid recognition. Subject to the agreement of DGCA in any particular case, computer-generated signatures are permitted if it can be demonstrated that an equivalent level of control, traceability and accountability exists. (See AMC No.1 to 21.163(c) for computer generated signature).

Block 13c Approval/Authorisation Number

Enter the approval/authorisation number/reference. This number or reference is issued by the DGCA to the organisation releasing the new items.

Block 13d Name

Enter the name of the person signing block 13b in a legible form.

Block 13e The date on which Block 13b is signed, in the format day/month/year. The month must be stated in letters (sufficient letters must be used so there can be no ambiguity as to the month intended).

Block 14a-14e

General Requirements for blocks 14a-14e:

Not used for production release. Shade, darken, or otherwise mark to preclude inadvertent or unauthorised use.
User/Installer Responsibilities

Place the following statement on the certificate to notify end users that they are not relieved of their responsibilities concerning installation and use of any item accompanied by the form: 'THIS CERTIFICATE DOES NOT AUTOMATICALLY CONSTITUTE AUTHORITY TO INSTALL.

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.'



GOVERNMENT OF INDIA
DIRECTORATE GENERAL OF CIVIL AVIATION

# AIRWORTHINESS REVIEW CERTIFICATE

ARC REFERENCE:

Pursuant to the Convention on International Civil Aviation dated the 7th December, 1944, and the Aircraft Rules,1937 as amended from time to time, DGCA hereby certifies that the following aircraft:

**Aircraft manufacturer …….**

**Manufacturer's designation of aircraft: ……....**

**Aircraft type: ……..……**

**Aircraft registration: ……..…..**

**Aircraft serial Number: ……..……**

is considered to be airworthy at the time of the issue.

Date of issue: ..... ……. Date of expiry: ... .....

Signed:…….. Authorisation No: ……

**FORM CA-20 - SPECIAL FLIGHT PERMIT**

<table>
<tr><td colspan="2"><br>GOVERNMENT OF INDIA<br>DIRECTORATE GENERAL OF CIVIL AVIATION</td></tr>
<tr><td colspan="2">SPECIAL FLIGHT PERMIT</td></tr>
<tr><td>(*)</td><td></td></tr>
<tr><td>DGCA hereby permit noted aircraft to fly within India under conditions listed below.</td><td>1. Nationality and registration marks</td></tr>
<tr><td>2. Aircraft manufacturer/type</td><td>3. Serial number</td></tr>
<tr><td colspan="2">4. The permit covers</td></tr>
<tr><td colspan="2">5. Holder:</td></tr>
<tr><td colspan="2">6. Limitations/ Remarks</td></tr>
<tr><td colspan="2">7. Validity period:</td></tr>
<tr><td>8. Place and date of issue</td><td>9. Signature of DGCA representative</td></tr>
</table>

**This permit shall be carried on board during all flights**

(*) For use by State of registry.

**FORM CA-23 – CERTIFICATE OF AIRWORTHINESS**

| स० / No.: | | ना० ि व०२३ / C.A. 23 |
|---|---|---|



**भारत / India**

**नागरिवमाननमहाि नदेशालय / Directorate General of Civil Aviation**

## उड़न-यो□यता □माण-प□ / Certificate Of Airworthiness

| रh ीयतातथापजीकरणिच:ह / Nationality and Registration Mark | ि वमानिनमातातथाि वमानिनमाता□ ाराि वमानकोठदयागया नाम / Manufacturer and Manufacturer's Designation of Aircraft | ि वमान□मस० / Aircraft Serial No. |
|---|---|---|
| | | |

| | |
|---|---|
| वग / Category | |
| उप-□भाग/ Sub-Division | |
| आव□यक:यूनतमकम२दल / Minimum Crew Necessary | |
| □ ाि धकतअिधकतमकुलभार / Maximum All –Up –Weight Authorized | |

इसिवमानकापध्रचालनइसिवमानकेस□ब:धम™जारीकऽगयीअनुमोठदतउड़ान-
ि नयमावलीतथाउसम™ठकयेगएउ◌ेरवत२सशोधन□केअनुसारठकयाजायेगा।यहउड़ान-ि नयमावलीइसउड़न-यो□यता □माण-प□काएकभागसमझीजायेगी तथाि वमानम™जायेगी।

This aircraft is to be operated in accordance with the approved Flight Manual and its subsequent amendments, issued in respect of this aircraft. The Flight Manual shall form a part of this Certificate of Airworthiness and shall be carried on board.

यहउड़न-यो□यता □माण-प□,उपयु□ ि वमान, ि जसेपूव□□ शत□एवस□ब□पध्रचालनपध्रसीमाN केअनुऽपसाधाध्रतऔर□चाि लतठकयेजानेपरउड़न-यो□यसमझाजाताह; उसकेि लए०७ठदसबर, १९४४केअतरrh ीयनागरिवमाननिवषयकअिभसमयतथासमय-समयपरयथासशोि धत ि वमान-ि नयमावली, १९३७, केअनुसारजारीठकयाजाताह।

This Certificate of Airworthiness is issued pursuant to the Convention on International Civil Aviation, dated 07th December, 1944, and the Aircraft Rules, 1937, as amended from time to time, in respect of the above mentioned aircraft which is considered to be airworthy when maintained and operated in accordance with the foregoing and the pertinent operating limitations.

यठदउपरो□ अिनवायशत पूरीकरदीगयीह.तोयह□माण-प□उड़न-यो□यता पुनरावलोकन□माण-प□क◌ऽवहतारहनेतकवहरहेगाबशत ठकइस□माण-प□कोवापसनहc्लेि लयाजाताअथवाि नलिबतनहc्करठदयाजाता।

This Certificate of Airworthiness shall remain valid, subjected to the above compulsory conditions being fulfilled along with valid Airworthiness Review Certificate, unless withdrawn, or suspended.

**ह३ता□र / Signature :**

**नाम / Name :**

**पदनामकसाथ मुहर / Designation with Seal :**

**जारीकरनकाठदनाक/ Date of Issue :**

**नयीठद□ली / New Delhi.**

**FORM CA-24 - SPECIAL CERTIFICATE OF AIRWORTHINESS**

| (*) | DGCA | (*) |
|---|---|---|
| 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 issued pursuant to (**) [the Convention on International Civil Aviation dated 7 December 1944] and the Aircraft Rules,1937 as amended from time to time, in respect of the above mentioned aircraft which is considered to be airworthy when maintained and operated in accordance with the foregoing and the pertinent operating limitations.<br><br>In addition to above the following restrictions apply:<br><br>(**) [The aircraft may be used in international navigation notwithstanding above restrictions].<br><br>Date of issue: Signature: | | |
| 6. This Certificate of Airworthiness is valid unless revoked by DGCA.<br>A current Airworthiness Review Certificate shall be attached to this Certificate. | | |

**This permit shall be carried on board during all flights**

(*) For use by State of registry.

(**) Delete as applicable.

## FORM CA-25 – APPLICATION FOR ISSUE OF CERTIFICATE OF AIRWORTHINESS

**GOVERNMENT OF INDIA**
**CIVIL AVIATION DEPARTMENT**

**Application for Issue of Certificate of Airworthiness**

**Form CA-25**

| | |
|---|---|
| 1. Name and Address of owner | |
| 2. Nationality | |
| 3. Name and address of applicant (if other than the owner of aircraft) | |
| 4. Name and address of manufacturer | |
| 5. Date of manufacture | |
| 6. State of design | |
| 7. Registration Mark | |

**8. Description of aircraft**

| | | | |
|---|---|---|---|
| (a) New or used | | (f) Number of engines fitted | |
| (b) Type | | (g) Type of propeller (where applicable) | |
| (c) Series | | (h) Certified passenger seating capacity | |
| (d) Manufacturer's serial number. | | (i) Avionics installed | |
| (e) Type of engine | | (j) Minimum crew required (As per AFM or manufacturers document) | |

| | |
|---|---|
| 9. Maximum take-off mass of aircraft (as given in manufacturers document) | |

**10. Total number of hours flown since manufacture:**

| | |
|---|---|
| (a) Aircraft……hours ……cycles (if applicable) | (b) Engine in hours/cycle Port……(inboard)……(outboard) Starboard……(inboard)…… (outboard) |
| 11. Hours flown since last C of A renewal (if applicable) | |
| 12. Last major inspection carried out: | |

| | |
|---|---|
| 13. Date of last major inspection: | |
| 14. Is the aircraft: *(Applicable for aircraft manufactured in India)*<br>a) a prototype,<br>b) Series aircraft, | |
| 15. *(Applicable for foreign manufactured aircraft)*<br>(a) State of Origin of Certificate of Airworthiness presented<br>(b) Serial Number of the Certificate of Airworthiness presented<br>(c) Export C of A or equivalent document<br>(d) C of A category:<br>i) Passenger<br>ii) Mail/goods<br>iii) Aerial work<br>iv) Private<br>e) Special category (specify) | |
| 16. Name and address of Approved Organisation/ Licensed Aircraft Maintenance Personnel with whom aircraft is available for inspection | |
| 17. The fee shall be paid through online web portal https://bharatkosh.gov.in/ as per Rule 62 (1)(D) of the Aircraft Rules, 1937. Provide copy of receipt with Transaction Reference No. | |
| 18. DECLARATION<br><br>I hereby declare that the particulars entered on this application and the appendix is true and correct to the best of my knowledge and belief.<br><br>**Date:** **Signature**<br>**Designation** | |
| **Note**: Duly filled application form, should be accompanied by the following:<br><br>*1. Details of aircraft as per Appendix B should be forwarded to the Director General of Civil Aviation.*<br><br>*2. Certificate of Erection signed by an Aircraft Maintenance Engineer/ authorized personnel.*<br><br>*3. Certificate of Flight Test signed by licenced / authorised pilot.*<br><br>*4. Documents as required in CAR Section 2, Series 'F' Part III.* | |

**Appendix A**
**APPENDIX TO THE CA 25**

**DETAILS OF AIRCRAFT SYSTEMS, INSTRUMENTS AND EQUIPMENT INSTALLED IN THE AIRCRAFT**

| | |
|---|---|
| 1. Pressurization system | |
| 2. Automatic flight control and guidance systems | |
| 3. Cockpit voice recorder- state duration of recording (Rotor RPM recording facility on CVR for helicopters only ) | |
| 4. Electric power generators: | |
| 4.1 Engine driven -<br>a) AC only- (including alternators with built-in rectification) furnish frequency range<br>b) DC and AC | |
| 4.2 Helicopter transmission driven -<br>a) DC only (including alternators with built-in rectification)<br>b) DC and AC<br>c) AC only, frequency range | |
| 5. Main batteries:<br>a) Nickel/ Cadmium<br>b) Lead/ Acid<br>c) Number fitted | |
| 6. Oxygen System:<br>a) Installed<br>b) Portable | |
| 7. Engine fire detection system | |
| 8. Portable fire extinguishers | |
| 9. Stall detection and warning system | |
| 10. Fuel quantity indicating system | |
| 11. Ice and rain protection systems | |
| 12. Type of DFDR installed | |

| | |
|---|---|
| 13. Emergency lighting system including Emergency Escape path lighting | |
| 14. Anti-collision lighting<br>a) Rotating beacons<br>b) Strobe lights | |
| 15. Compasses:<br>a) Remote reading<br>b) Direct reading | |
| 16. Automatic navigation system | |
| 17. Rotor low rpm warning indication system (helicopters only) | |
| 18. Additional Systems installed for Aerial work operations | |
| **OTHER INFORMATION** | |
| 19. Are there provisions for the installation of safety harnesses at -<br>a) Flight crew seat positions?<br>b) Cabin crew seat positions?<br>c) Passenger seat positions? | |
| 20. Are there provisions for carrying external loads? | |
| 21. Are there provisions for glider towing? | |
| 22. State total fuel capacity kg | |
| 23. Give details of equipment (other than that listed in 1 to 18) which has been introduced by modification action (state manufacturer and type) | |
| 24. Give details of changes, if any, introduced in the Flight Manual, as a result of modification action | |
| **Note:** ***All items should be completed as appropriate; in cases where items are not relevant, the words "Not applicable" should be entered.*** | |
| Date: Signature<br>Designation | |

**APPENDIX B**

**FEES FOR ISSUE, RENEWAL OR VALIDATION OF CERTIFICATE OF AIRWORTHINESS (in accordance with para D of Rule 62)**

"(C) Issue, renewal or validation of Certificate of Airworthiness under rule 50:

(i) issue of Certificate of Airworthiness for an aircraft having maximum permissible take off weight —
(a) of 1,000 kilograms or less **:** Rs.20,000/-
(b) exceeding 1,000 kilograms, for every 1,000 kilograms or part thereof**:** Rs.1,000/-

(ii) validation or renewal of Certificate of Airworthiness **:** Fifty percent of the fees payable under sub-item (i).

(iii) issue of duplicate Certificate of Airworthiness**:** Ten percent of the fees payable under sub-item (i)"

GOVERNMENT OF INDIA
DIRECTORATE GENERAL OF CIVIL AVIATION

**FORM CA-30 – Application for Type Certificate (TC)/ Restricted Type Certificate (RTC)**

# Application for Type Certificate (TC)/ Restricted Type Certificate (RTC)

**1. Applicant**

| | |
|---|---|
| 1.1 Company Name, Company registration number, Address; Telephone, Fax and E-mail of Contact Person & Authorised Person | *[provide copy of registration with national Companies register]* |
| 1.2 Design Organisation Approval (DOA) status | |

**2. Product identification and fees information**

| | | |
|---|---|---|
| ☐ Type Certificate | ☐ Derivative/variant | ☐ Restricted Type Certificate (RTC) |

The fee shall be paid through online web portal https://bharatkosh.gov.in/ as per Rule 62 (1) (A) of the Aircraft Rules, 1937. Provide copy of receipt with Transaction Reference No.

**2 (a) Fixed wing aircraft**

| | |
|---|---|
| Large Aeroplanes<br>☐ over 5,700 kg | Small/ Light Aeroplanes<br>☐ over 5,700 kg up to 8,620 kg(incl. commuter) ☐ VLA<br>☐ up to 5,700 kg ☐ Powered sailplanes<br>☐ LSA ☐ Sailplanes |

| | | | |
|---|---|---|---|
| **2(b) Rotary wing aircraft** | ☐ Transport category rotorcraft | ☐ Normal category rotorcraft | ☐ Very Light Rotorcraft |

**2.(c) Propulsion**

| | |
|---|---|
| Engines<br>☐ Reciprocating<br>☐ Turbine | Propeller<br>☐ |
| **2.(d) Manned Hot Air Balloon** | ☐ |

| | |
|---|---|
| 2.2 Type / Model designation(s) | |
| 2.3 Foreign Approval Reference, and restrictions *(if applicable)* | |
| 2.4 Restriction *(if applying for RTC, to indicate kind of restriction)* | |

**3. Applicable Airworthiness Code:** Refer CAR 21.16A

**4. Applicant's declaration**

I confirm that the information contained herein is correct and complete. I agree to pay the fees levied by DGCA in respect of the issuance of a Type Certificate / Restricted Type Certificate and am aware of the consequences of non-payment.

**5. Signature**

| Date | Name of the Authorised Representative | Signature |
|---|---|---|
| | | |

This Application should be sent to:
Director (Aircraft Engineering Directorate), Directorate General of Civil Aviation,
Opposite Safdarjung Airport, New Delhi- 110 003, India, Telephone: 91-11-24623211

Information to be entered into TC / restricted TC application form:

The use of this form is required to enable DGCA to process applications without undue delay. The individual fields of the application form may be varied in size to allow entry of all required information. The application should be in English language.

Field 1.1: enter the name of the legal entity making the application, Company registration number (with copy of Indian Companies register), address; enter the name, telephone, fax and e-mail of contact person for this application and authorized person

Field 1.2: for applicants within the country: reference to DOA / alternative procedures approval or related application made to DGCA e.g. for extension of scope related to this product

Field 2.1: the weight category shall refer to the maximum take-off weight (MTOW) of the aircraft type/model as specified in the type certificate data sheet

Field 2.2: give a brief description of type and model applied for and, as applicable, make further reference to drawings, basic data, ops characteristics/limitations as required by CAR 21 Para 21.15

Field 2.3: for applicants outside the country: enter reference to approval of the State of Design of the aircraft

Field 2.4: applications for restricted TC only: explain the reason for restriction

Field 5: signature of an authorised representative of the applicant



# GOVERNMENT OF INDIA
# DIRECTORATE GENERAL OF CIVIL AVIATION

**FORM CA-31 – Application for Approval of Major Change/ Major Repair Design**

## Application for Approval of Major Change / Major Repair Design

**1. Applicant**

| | |
|---|---|
| 1.1 Company Name, Company registration number, Address; Telephone, Fax and E-mail of Contact Person & Authorised person | *[provide copy of registration with national Companies register]* |
| 1.2 Design Organisation Approval (DOA) status | |

**2. Classification, product identification**

☐ **Major Change**
☐ **Major Repair**
☐ **I**ncluding Change to approved parts of Flight Manual (FM)

**2.1 Fixed wing aircraft**

| | |
|---|---|
| Large Aeroplanes<br>☐ over 5,700 kg | Small/ Light Aeroplanes<br>☐ over 5,700 kg up to 8,620 kg(incl. commuter) ☐ VLA<br>☐ up to 5,700 kg ☐ Powered sailplanes<br>☐ LSA ☐ Sailplanes |

| | | | |
|---|---|---|---|
| **2.2Rotary wing aircraft** | ☐ Transport category rotorcraft | ☐ Normal category rotorcraft | ☐ Very Light Rotorcraft |

**2.3 Propulsion**

| | |
|---|---|
| Engines<br>☐ Reciprocating<br>☐ Turbine | Propeller<br>☐ |
| **2.4 Manned Hot Air Balloon** | ☐ |

**3. Applicable Airworthiness Code:** Refer CAR 21.16A

**4. Applicability / Description**

| | |
|---|---|
| 4.1 Applicability, Title, Description, Affected Areas (including manuals), Re-Investigations and Justification *(non TC-holder repairs only)* | |
| 4.2 Foreign Approval Reference, and restrictions *(if applicable)* | |

**5. Applicant's declaration**

I confirm that the information contained herein is correct and complete.

**6. Signature**

| Date | Name of the Authorised Representative | Signature |
|---|---|---|
| | | |

This Application should be sent to:
Director (Aircraft Engineering Directorate), Directorate General of Civil Aviation,
Opposite Safdarjung Airport, New Delhi- 110 003, India, Telephone: 91-11-24623211

Information to be entered into major change / major repair design approval application form :

Note: STC holders are requested to use this form also for major changes to their STC and make reference to the STC in field 4.1.

The use of this form is required to enable DGCA to process applications without undue delay. The individual fields of the application form may be varied in size to allow entry of all required information. The application should be in English language.

Field 1.1: enter the name of the legal entity making the application, Company registration number (with copy of Indian Companies register), address; enter the name, telephone, fax and e-mail of contact person for this application and authorized person

Field 1.2: for applicants within the country: make reference to DOA / alternative procedures approval or related application made to DGCA e.g. for extension of scope related to this design change

Field 2.1: the weight category shall refer to the maximum take-off weight (MTOW) of the aircraft type/model as specified in the type certificate data sheet

Field 3: identify the applicable airworthiness code proposed to be used for DGCA certification

Field 4.1:

- For applicability: enter make, type / model, DGCA - or grandfathered NAA-TC / -ITSO number of the original product / equipment, or reference to STC (in case of major change by STC-holder)
- For Title : give a title of the design change / repair design
- For Description: give a brief description of the design change / damage and repair design
- For Affected Areas (including manuals): identify all parts of the type design and the approved manuals affected by the change / repair, and the airworthiness codes and environmental protection requirements with which the change / repair has been designed; if necessary make reference to further attached documents in e.g. relating to CAR 21, § 21.101 compliance
- For Re-Investigations: identify any re-investigations necessary to show compliance of the changed / repaired product / equipment with the applicable airworthiness codes and environmental requirements; if necessary make reference to further attached documents
- For Justification *(non TC-holder repairs only):* third party major repairs only: justify that the information provided is adequate either from own resources or through an arrangement with the TC-holder

Field 4.2: for applicants outside the country: enter reference to approval of the State of Design of the change / repair

Field 6: signature of an authorised representative of the applicant



# GOVERNMENT OF INDIA
# DIRECTORATE GENERAL OF CIVIL AVIATION

**FORM CA-32 – Application for Approval of Minor Change/ Minor Repair Design**

## Application for Approval of Minor Change / Minor Repair Design

**1. Applicant**

| | |
|---|---|
| 1.1 Name, Address; Telephone, Fax and E-mail of Contact Person & Authorised person | |
| 1.2 Design Organisation Approval (DOA) Status | |

**2. Classification, product identification**

☐ Minor Change
☐ Minor Repair
☐ Including Change to approved parts of Flight Manual (FM)

**2.1 Fixed wing aircraft**

| | |
|---|---|
| Large Aeroplanes<br>☐ over 5,700 kg | Small/ Light Aeroplanes<br>☐ over 5,700 kg up to 8,620 kg(incl. commuter) ☐ VLA<br>☐ up to 5,700 kg ☐ Powered sailplanes<br>☐ LSA ☐ Sailplanes |

| | | | |
|---|---|---|---|
| **2.2Rotary wing aircraft** | ☐ Transport category rotorcraft | ☐ Normal category rotorcraft | ☐ Very Light Rotorcraft |

**2.3 Propulsion**

| | |
|---|---|
| Engines<br>☐ Reciprocating<br>☐ Turbine | Propeller<br>☐ |
| **2.4 Manned Hot Air Balloon** | ☐ |

**3. Applicable Airworthiness Code:** Refer CAR 21.16A

**4. Applicability / Description**

| | |
|---|---|
| 4.1 Applicability, Title, Description, Affected Areas (including manuals) | |
| 4.2Foreign Approval Reference *(if applicable)* | |

**5. Applicant's declaration**

I confirm that the information contained herein is correct and complete.

**6. Signature**

| Date | Name of the Authorised Representative | Signature |
|---|---|---|
| | | |

This Application should be sent to:
Director (Aircraft Engineering Directorate), Directorate General of Civil Aviation,
Opposite Safdarjung Airport, New Delhi- 110 003, India, Telephone: 91-11-24623211

Information to be entered into minor change / minor repair application form:

The use of this form is required to enable DGCA to process applications without undue delay. The individual fields of the application form may be varied in size to allow entry of all required information. The application should be in English language.

Field 1.1: enter the name of the legal entity making the application, Company registration number (with copy of Indian Companies register), address; enter the name, telephone, fax and e-mail of contact person for this application and authorized person

Field 1.2: for applicants within the country: make reference to DOA / alternative procedures approval or related application made to DGCA e.g. for extension of scope related to this design change

Field 2: identify minor change or minor repair

Field 2.1: identify the kind of product / equipment for which an application is made by ticking the related checkboxes; the weight category shall refer to the maximum take-off weight (MTOW) of the aircraft type/model as specified in the type certificate data sheet

Field 3: identify the applicable airworthiness code proposed to be used for DGCA certification

Field 4.1:

- For applicability: enter manufacturer, type / model, DGCA - or grandfathered NAA-TC / -ITSO number of the original product / equipment
- For Title : give a title of the design change / repair design
- For Description: give a brief description of the design change / damage and repair design
- For Affected Areas (including manuals): identify all parts of the type design and the approved manuals affected by the change / repair, and the airworthiness codes and environmental protection requirements with which the change / repair has been designed

Field 4.2: for applicants outside the country: enter reference to approval of the State of Design of the change / repair

Field 6: signature of an authorised representative of the applicant

GOVERNMENT OF INDIA
DIRECTORATE GENERAL OF CIVIL AVIATION

**FORM CA-33 – Application for Approval of Supplemental Type Certificate (STC)**

## Application for Approval of Supplemental Type Certificate (STC)

**1. Applicant**

| | |
|---|---|
| 1.1 Company Name, Company registration number, Address; Telephone, Fax and E-mail of Contact Person & Authorised Person | *[provide copy of registration with national Companies register]* |
| 1.2 Design Organisation Approval (DOA) status | |

**2. Classification, product identification and fees information**

| | |
|---|---|
| **Description of Change** | |

☐ Including Change to approved parts of Flight Manual (FM)

**2.1 Fixed wing aircraft**

| | |
|---|---|
| Large Aeroplanes<br>☐ over 5,700 kg | Small/ Light Aeroplanes<br>☐ over 5,700 kg up to 8,620 kg(incl. commuter) ☐ VLA<br>☐ up to 5,700 kg ☐ Powered sailplanes<br>☐ LSA ☐ Sailplanes |

| | | | |
|---|---|---|---|
| **2.2 Rotary wing aircraft** | ☐ Transport category rotorcraft | ☐ Normal category rotorcraft | ☐ Very Light Rotorcraft |

**2.3 Propulsion**

| | |
|---|---|
| Engines<br>☐ Reciprocating<br>☐ Turbine | Propeller<br>☐ |
| **2.4 Manned Hot Air Balloon** | ☐ |

The fee shall be paid through online web portal https://bharatkosh.gov.in/ as per Rule 62 (1)(F) of the Aircraft Rules, 1937. Provide copy of receipt with Transaction Reference No.

**3. Applicable Airworthiness Code:** Refer CAR 21.16A

**4. Applicability / Description**

| | |
|---|---|
| 4.1 Applicability, Title, Description, Affected Areas (including manuals), Re-Investigations and Justification *(non TC-holder repairs only)* | |
| 4.2 Foreign Approval Reference, and restrictions *(if applicable)* | |

**5. Applicant's declaration**

I confirm that the information contained herein is correct and complete. I agree to pay the fees levied by DGCA in respect of the issuance of a Supplemental Type Certificate and am aware of the consequences of non-payment.

**6. Signature**

| Date | Name of the Authorised Representative | Signature |
|---|---|---|
| | | |

This Application should be sent to:
Director (Aircraft Engineering Directorate), Directorate General of Civil Aviation,
Opposite Safdarjung Airport, New Delhi- 110 003, India, Telephone: 91-11-24623211

Information to be entered into STC approval application form:

Note: STC holders are requested to use this form also for major changes to their STC and make reference to the STC in field 4.1.

The use of this form is required to enable DGCA to process applications without undue delay. The individual fields of the application form may be varied in size to allow entry of all required information. The application should be in English language.

Field 1.1: enter the name of the legal entity making the application, address; enter the name, telephone, fax and e-mail of contact person for this application and authorized person

Field 1.2: for applicants within the country: make reference to DOA / alternative procedures approval or related application made to DGCA e.g. for extension of scope related to this design change

Field 2.1: the weight category shall refer to the maximum take-off weight (MTOW) of the aircraft type/model as specified in the type certificate data sheet

Field 3: identify the applicable airworthiness code proposed to be used for DGCA certification

Field 4.1:

- For applicability: enter make, type / model, DGCA - or grandfathered NAA-TC / -ITSO number of the original product / equipment, or reference to STC (in case of major change by STC-holder)
- For Title : give a title of the design change / repair design
- For Description: give a brief description of the design change / damage and repair design
- For Affected Areas (including manuals): identify all parts of the type design and the approved manuals affected by the change / repair, and the airworthiness codes and environmental protection requirements with which the change / repair has been designed; if necessary make reference to further attached documents in e.g. relating to CAR 21, § 21.101 compliance
- For Re-Investigations: identify any re-investigations necessary to show compliance of the changed / repaired product / equipment with the applicable airworthiness codes and environmental requirements; if necessary make reference to further attached documents
- For Justification *(non TC-holder repairs only):* third party major repairs only: justify that the information provided is adequate either from own resources or through an arrangement with the TC-holder

Field 4.2: for applicants outside the country: enter reference to approval of the State of Design of the change / repair

Field 6: signature of an authorised representative of the applicant



# GOVERNMENT OF INDIA
# DIRECTORATE GENERAL OF CIVIL AVIATION

**FORM CA-34 – Application for Approval of Indian Technical Standard Order Authorisation**

## Application for Indian Technical Standard Order Authorisation (ITSOA)

**1. Applicant**

| | |
|---|---|
| 1.1 Company Name, Company registration number, Address; Telephone, Fax and E-mail of Contact Person & Authorised Person | *[provide copy of registration with national Companies register]* |
| 1.2 Design Organisation Approval (DOA) status (in case of APU) | Applicant has to demonstrate capability in accordance with CAR 21 Subpart B and should hold DOA as per Subpart JA |

**2. Article / Equipment identification and fees information**

| | |
|---|---|
| 2.1 Kind of Equipment / Product | |
| 2.2 Type/ Model | |
| 2.3 Description | |
| 2.4 Part No. | |

The fee shall be paid through online web portal https://bharatkosh.gov.in/ as per Rule 62 (1)(CA) of the Aircraft Rules, 1937 for ITSOA for all items except APU.
For APU applicant fees will be as per Rule 62 (1)(A)(ii)(a). Provide copy of receipt with Transaction Reference No.

**3. Certification Basis**

| | | | |
|---|---|---|---|
| 3.1 ITSO Standard(s) | | | |
| 3.2 Deviations | State either "None" or state deviations | | |
| 3.3 Aircraft Station License Data *(for transmitting equipment only)* | Emission Power | Emission Class | Frequency Band |
| | | | |

**4. Data Requirements**

| | |
|---|---|
| 4.1 Part No. System *(description of the coding within open brackets )* | |
| 4.2 Production Reference *(if applicable)* | |
| 4.3 Design Reference *(if applicable)* | |

**5. Applicant's declaration**

I confirm that the information contained herein is correct and complete. I agree to pay the fees levied by DGCA in respect of the issuance of an ITSOA and am aware of the consequences of non-payment.

| Date | Name of the Authorised Representative | Signature |
|---|---|---|
| | | |

This Application should be sent to:
Director (Aircraft Engineering Directorate), Directorate General of Civil Aviation,
Opposite Safdarjung Airport, New Delhi- 110 003, India, Telephone: 91-11-24623211

Information to be entered into ITSOA application form:

The use of this form is required to enable DGCA to process applications without undue delay. The individual fields of the application form may be varied in size to allow entry of all required information. The application should be in English language.

Field 1.1: enter the name of the legal entity making the application, address; enter the name, telephone, fax and e-mail of contact person for this application and authorized person

Field 1.2: Applicant has to demonstrate capability in accordance with CAR 21 Subpart B and should hold DOA as per Subpart JA in case of APU

Field 2.1-2.4: self explanatory

Field 3.1 enter ITSO standard(s)

Field 3.2: list deviations and make reference to document explaining the compensating factors or the design features providing an equivalent level of safety (document to be attached to application) or state "None" if the equipment is fully compliant with the requirements

Field 3.3: for transmitting equipment: enter emission power, emission classes and frequency band

Field 4.1 describe part number system to identify minor changes

example:
the part number of the article will be composed of a basic part number and wild card characters in brackets related to the minor changes as follows:
ABCD-(XXX)-(XXX)

Field 4.2: applicants within the country: enter POA number according to CAR 21 subpart G or reference to letter of agreement according to CAR 21 subpart F

Field 4.3: applicants within the country: for APUs: make reference to DOA handbook i.a.w. 21.605(e);
for all other articles make reference to procedures i.a.w. 21.605(f) or related application made to DGCA e.g. for extension of scope related to this article

Field 5: signature of an authorised representative of the applicant



GOVERNMENT OF INDIA
DIRECTORATE GENERAL OF CIVIL AVIATION

**FORM CA-35 – Statement of Compliance for Indian Technical Standard Order Authorisation (ITSOA)**

| Statement of Compliance for Indian Technical Standard Order Authorisation (ITSOA) | | |
|---|---|---|
| **1. Applicant** | | |
| 1.1 Name, Address; Telephone, Fax and E-mail of Contact Person & Authorised Person | | |
| **2. Article Identification** | | |
| 2.1 Type / Model | | |
| 2.2 Part No(s). | | |
| **3. Certification Basis** | | |
| 3.1 Standard(s), Class(es) | | |
| 3.2 Deviations (if any) | | |
| **4. Statement of Compliance** | | |
| It is certified that:<br>1. Except for the deviations stated in field 3.2 above, the article meets the requirements of CAR 21, Subpart O and the listed ITSO Specifications.<br>2. The deviations stated in field 3.2 above are compensated for by factors or design features providing an equivalent level of safety as shown in the document annexed to this statement.<br>3. The quality control integrity of these articles is attested by the issuance of an Authorised Release Certificate for each article. | | |
| Date | Name of the Authorised Representative | Signature |

Information to be entered into Statement of Compliance for ITSOA form:

Field 1: self explanatory

Field 2: self explanatory

Field 3.1 enter ITSO standard(s) and class(es)

Field 3.2: list deviations and make reference to document explaining the compensating factors or the design features providing an equivalent level of safety (document to be attached to statement of compliance)

Field 4: signature of an authorised representative of the applicant

**FORM CA2006-1A – Application for Issue of Noise Certificate**




GOVERNMENT OF INDIA
**DIRECTORATE GENERAL OF CIVIL AVIATION**

**Form CA 2006-1A**

# Application for Issue of Noise Certificate

| | |
|---|---|
| **1. PARTICULARS REGARDING THE APPLICANT** | |
| **1.1 Company Name, Company registration number, Address; Telephone, Fax and E-mail of Contact Person & Authorised Person** | *[provide copy of registration with national Companies register]* |
| **2. PARTICULARS REGARDING THE AIRCRAFT** | |
| **2.1 Aircraft Registration:** | **2.2 Aircraft manufacturer:** |
| **2.3 Aircraft model:** | **2.4 Aircraft Serial number:** |
| **2.5 Date of manufacture:** | **2.6 Flight Manual reference:** |
| **2.7 Maximum take-off weight:** | **2.8 Maximum landing weight:** |
| **2.11 Engine serial number:** | **2.12. Propeller manufacturer:** |
| **2.13 Propeller model:** | **2.14 Propeller serial number:** |
| **2.15 Noise certification Standards:** | |
| **2.16 Additional modification incorporated if any for the purpose of compliance with the applicable noise certification Standards:** | |

| | | | | |
|---|---|---|---|---|
| **2.17 Lateral/ full-power noise level:** | **2.18 Approach noise level:** | **2.19 Flyover noise level:** | **2.20 Overflight noise level:** | **2.21 Take-off noise level:** |

**2.22 ATTACHED DOCUMENTS (as required) (See CAR 21.204)**

**I hereby certify that the particulars provided in this application are true in every respect. It is further certified that the aircraft has been maintained as per manufacturer's recommendations and no modification has been carried out which may degrade the noise level while flying.**

**Date** **Signature of Authorised Representative:**
**Title:**

## Record of Action

**For DGCA Use Only For DGCA Use Only**

**3. REMARKS:** (Examination of the application and the supporting documents for evaluation of eligibility)

*Attach additional sheets, if required.*

**4. INSPECTION OF AIRCRAFT: (if carried out)**

| | |
|---|---|
| **Date of Inspection:** | **Inspecting Officer:** |
| **Noise Certificate No.: (issued)** | |

**FORM CA-45A – Noise Certificate**

**OFFICE OF**
**DIRECTOR GENERAL**
**OF CIVIL AVIATION**
TECHNICAL CENTRE, OPP SAFDARJANG
AIRPORT, NEW DELHI – 110 003

| Certificate No.: |
|---|
| |

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**GOVERNMENT OF INDIA**

# NOISE CERTIFICATE

## Form-CA-45A

| | | | | |
|---|---|---|---|---|
| **1. Aircraft Type:** | | **2. Aircraft model:** | | |
| **3. Engine:**<br>**Type:** **Model:** | | **4. Propeller**<br>**Type:** **Model:** | | |
| **5. Maximum Take-off mass:**<br>(kg) | **6. Maximum landing mass:**<br>(kg) | | **7. Noise certification Standards:** | |
| 8. Additional modifications incorporated for the purpose of compliance with the applicable noise certification standards | | | | |
| **9. Lateral/ full-power noise level:** | **10. Approach noise level:** | **11. Flyover noise level:** | **12. Overflight noise level:** | **13. Take-off noise level:** |
| 14. Remarks | | | | |
| **15. This noise certificate is issued pursuant to Volume I of Annex 16 to the Convention on International Civil Aviation, in respect of the above mentioned aircraft, which is considered to comply with the indicated noise Standard when maintained and operated in accordance with the relevant requirements and operating limitations.** | | | | |
| **16. Date of issue:** | | **17. Signature:**<br>**Name:**<br>**Designation/Seal:** | | |

**FORM CA2006-1 – Application for Issue of Noise Certificate**




GOVERNMENT OF INDIA
**DIRECTORATE GENERAL OF CIVIL AVIATION**

**Form CA 2006-1**

# Application for Issue of Noise Certificate

| **1. PARTICULARS REGARDING THE APPLICANT** | | |
|---|---|---|
| **1.1 Name** | | **1.2 Address for communication** |
| Phone | Fax | e-mail |

| **2. PARTICULARS REGARDING THE AIRCRAFT** | |
|---|---|
| **2.1 Aircraft Registration:** | **2.2 Aircraft manufacturer:** |
| **2.3 Aircraft model:** | **2.4 Aircraft Serial number:** |
| **2.5 Date of manufacture:** | **2.6 Flight Manual reference:** |
| **2.7 Maximum take-off mass:** | **2.8 Maximum landing mass:** |
| **2.9 Engine manufacturer:** | **2.10 Engine model:** |
| **2.11 Engine serial number:** | **2.12 Noise certification Standards:** |

**2.13 Additional modification incorporated if any for the purpose of compliance with the applicable noise certification Standards:**

| **2.15 Lateral/ full-power noise level:** | **2.16 Approach noise level:** | **2.17 Flyover noise level:** | **2.18 Overflight noise level:** | **2.19 Take-off noise level:** |
|---|---|---|---|---|

**2.20 ATTACHED DOCUMENTS (as required) (See CAR 21.204)**

**I hereby certify that the particulars provided in this application are true in every respect. It is further certified that the aircraft has been maintained as per manufacturer's recommendations and no modification has been carried out which may degrade the noise level while flying.**

**Date:** **Signature:**
**Title:**

## Record of Action

**For DGCA Use OnlyFor DGCA Use Only**

**3. REMARKS:** (Examination of the application and the supporting documents for evaluation of eligibility)

*Attach additional sheets, if required.*

**4. INSPECTION OF AIRCRAFT: (if carried out)**

| **Date of Inspection:** | **Inspecting Officer:** |
|---|---|
| **Noise Certificate No.: (issued)** | |

**FORM CA-45 – Noise Certificate**

**OFFICE OF**
**DIRECTOR GENERAL**
**OF CIVIL AVIATION**
TECHNICAL CENTRE, OPP SAFDARJANG
AIRPORT, NEW DELHI – 110 003

**Certificate No.**[3] **:**

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**GOVERNMENT OF INDIA**[1]

# NOISE CERTIFICATE[2]

| | | |
|---|---|---|
| **4. Nationality and Registration Marks:** | **5. Manufacturer and Manufacturer's designation of aircraft:** | **6. Aircraft Serial No.:** |

| | |
|---|---|
| **7. Engine:**<br>**Type:** **Model:** | **8. Propeller**<br>**Type:** **Model:** |

| | | |
|---|---|---|
| **9. Maximum Take-off mass:**<br>(kg) | **10. Maximum landing mass:**<br>(kg) | **11. Noise certification Standards:** |

12. Additional modifications incorporated for the purpose of compliance with the applicable noise certification standards

| | | | | |
|---|---|---|---|---|
| **13. Lateral/ full-power noise level:** | **14. Approach noise level:** | **15. Flyover noise level:** | **16. Overflight noise level:** | **17. Take-off noise level:** |

17. Remarks

**18. This noise certificate is issued pursuant to Volume I of Annex 16 to the Convention on International Civil Aviation, in respect of the above mentioned aircraft, which is considered to comply with the indicated noise Standard when maintained and operated in accordance with the relevant requirements and operating limitations.**

| | |
|---|---|
| **19. Date of issue:** | **20. Signature:**<br>**Name:**<br>**Designation/Seal:** |

**FORM CA-50 – Application for production organisation approval under CAR 21, Subpart G**

| **Form CA-50**<br>**Application for production organisation approval under CAR 21, Subpart G** | |
|---|---|
| **DGCA** | |
| 1. Registered name and address of the organisation: | |
| 2. Trade name (if different): | |
| 3. Locations for which the approval is applied for: | |
| 4. Brief summary of proposed activities at the item 3 addresses | |
| a) General: | |
| b) Scope of approval: | |
| c) Nature of privileges: | |
| 5. Description of organisation: | |
| 6. Links/arrangements with design approval holder(s)/design organisation(s) where different from 1. : | |
| 7. Approximate number of staff engaged or intended to be engaged in the activities: | |
| 8. Position and name of the accountable manager: | |
| Date | Signature of the accountable manager |

Note : 1.Applicants for Production Organisation Approval (POA) under CAR 21, Subpart G, will be charged as per Rule 133C of the Aircraft Rules, 1937 through online web portal https://bharatkosh.gov.in/. Provide copy of receipt with Transaction Reference No.

2. The fees for renewal of POA shall be fifty percent of that of the new POA as above.

Block 1: The name of the organisation must be entered as stated in the register of the Indian Companies Registration Office. For the initial application a copy of the entry in the register of the Indian Companies Registration Office must be provided to the DGCA.

Block 2: State the trade name by which the organisation is known to the public if different from the information given in Block 1. The use of a logo may be indicated in this Block.

Block 3: State all locations for which the approval is applied for. Only those locations must be stated that are directly under the control of the legal entity stated in Block 1.

Block 4: This Block must include further details of the activities under the approval for the addresses indicated in Block 4. The Block "General" must include overall information, while the Block "Scope of approval" must address the scope of work and products/categories following t he principles laid down in the GM 21.151. The Block "nature of privileges" must indicate the requested privileges as defined in 21.163(b)-(d). For an application for renewal state "N/A".

Block 5: This Block must state a summary of the organisation with reference to the outline of the production organisation exposition, including the organisational structure, functions and responsibilities. The nomination of the responsible managers in accordance with 21.145(c)(2) must be included as far as possible, accompanied by the corresponding CA Forms 4.
For an application for renewal state "N/A".

Block 6: The information entered here is essential for the evaluation of eligibility of the application. Therefore special attention must be given concerning the completion of this Block either directly or by reference to supporting documentation in relation to the requirements of 21.133(b) and (c) and the AMC to 21.133(b) and (c).

Block 7: The information to be entered here must reflect the number of staff, or in case of an initial approval the intended number of staff, for the complete activities to be covered by the approval and therefore must include also any associated administrative staff.

Block 8: State the position and name of the accountable manager.

**FORM CA-51 – Application for significant changes or variation of scope and terms of Production Organization Approval under CAR 21, Subpart G**

| | | |
|---|---|---|
| **Application for significant changes or variation of scope and terms of Production Organization Approval under CAR 21, Subpart G** | | **Form CA - 51** |
| D G C A | | |
| 1. | Name and address of the POA holder: | |
| 2. | Approval reference number: | |
| 3. | Locations for which changes in the terms of approval are requested: | |
| 4. | Brief summary of proposed changes to the activities at the item 3 addresses | |
| | a) General: | |
| | b) Scope of approval: | |
| | c) Nature of privileges: | |
| 5. | Description of organizational changes: | |
| 6. | Position and name of the accountable manager or nominee: | |
| Date: | | Signature of Accountable Manager |

**Filling Instructions Form CA 51**

Block 1:The name must be entered as written on the current approval certificate. Where a change in the name is to be announced state the old name and address here, while using Block 5 for the information about the new name and address. The change of name and/or address must be supported by evidence, e.g. by a copy of the entry in the register of commerce.

Block 2: State the current approval reference number.
Block 3: State the locations for which changes in the terms of approval are requested or state "N/A" if no change is to be anticipated here.

Block 4: This Block must include further details for the variation of the scope of approval for the addresses indicated in Block 3. The Block "General" must include overall information for the change (including changes e.g. in workforce, facilities etc.), while the Block "Scope of approval" must address the change in the scope of work and products/categories following the principles laid down in the GM 21A.151. The Block "nature of privileges" must indicate a change in the privileges as defined in 21A.163(b)-(d). State "N/A" if no change is anticipated here.

Block 5: This Block must state the changes to the organisation as defined in the current production organisation exposition, including changes the organisational structure, functions and responsibilities. This Block must therefore also be used to indicate a change in the accountable manager in accordance with 21A.145(c)(1) or a change in the nomination of the responsible managers in accordance with 21A.145(c)(2). A change in the nomination of responsible managers must be accompanied by the corresponding CA Form 4. State "N/A" if no change is anticipated here.

Block 6: State the position and name of the accountable manager here. Where there is a change in the nomination of the accountable manager, the information must refer to the nominee for this position. State "N/A" if no change is anticipated here.

In case of an application for a change of the accountable manager the CA Form 51 must be signed by the new nominee for this position. In all other cases the CA Form 51 must be signed by the accountable manager.

**FORM CA-52 – Aircraft Statement of Conformity**

| AIRCRAFT STATEMENT OF CONFORMITY | | |
|---|---|---|
| 1. State of manufacture | 2. Civil Aviation Authority of the State of manufacture | 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<br><br>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.<br><br>The aircraft is in a condition of safe operation.<br><br>The aircraft has been satisfactorily tested in flight. | | |
| 18. Signed | 19. Name | 20. Date (d/m/y) |
| 21. Production Organisation Approval Reference | | |

(*) Delete as applicable

# AIRCRAFT STATEMENT OF CONFORMITY – FORM CA-52

## COMPLETION INSTRUCTIONS

For the purpose of Car 21 Subpart F, Statement of Conformity means Form CA-52 for complete aircraft or Form CA-1 for other products, parts, appliances and/or materials.

Authorised person means a person identified as signatory in the Manual accepted by DGCA and provided in accordance with 2l.125A (b).

Responsible position means a position held by a person with terms of reference which include responsibility for product conformity, and who has sufficient authority to prevent the release of items which do not conform to the applicable design data and/or are not in condition for safe operation.

## 1. PURPOSE AND SCOPE

Use of the aircraft Statement of Conformity issued by a manufacturer producing under Car 21 Subpart F is described under 21.130 and the corresponding acceptable means of compliance.

The purpose of the aircraft Statement of Conformity (Form CA-52) issued under CAR 21 Subpart G is to enable the holder of an appropriate production organisation approval to exercise the privilege to obtain an individual aircraft certificate of airworthiness from DGCA.

## 2. GENERAL

The Statement of Conformity must comply with the format attached including block numbers and the location of each Block. The size of each Block may however be varied to suit the individual application, but not to the extent that would make the Statement of Conformity unrecognisable. If in doubt consult DGCA.

The Statement of Conformity must either be pre-printed or computer generated but in either case the printing of lines and characters must be clear and legible. Pre-printed wording is permitted in accordance with the attached model but no other certification statements are permitted.

Completion may be either machine/ computer printed or hand-written using block letters to permit easy reading. The application should be in English language.

A copy of the Statement and all referenced attachments are to be retained by the approved production organisation.

## 3. COMPLETION OF THE STATEMENT OF CONFORMITY BY THE ORIGINATOR

There should be an entry in all Blocks to make the document a valid statement.

A Statement of Conformity may not be issued to regulatory authority of third country of registry unless the design of the aircraft and its installed products are approved.

The information required in Blocks 9, 10, 11, 12, 13 and 14 may be by reference to separate identified documents held on file by the production organisation, unless DGCA agrees otherwise.

This Statement of Conformity is not intended to include those items of equipment that may be required to be fitted in order to satisfy applicable operational rules. However, some of these individual items may be included in Block 10 or in the approved type design. Operators are therefore reminded of their responsibility to ensure compliance with the applicable operational rules for their own particular operation.

| | |
|---|---|
| Block 1 | Enter name of the State of manufacture. |
| Block 2 | Pre printed DGCA. |
| Block 3 | A unique serial number should be pre-printed in this Block for Statement control and traceability purposes. Except that in the case of a computer generated document the number need not be pre-printed where the computer is programmed to produce and print a unique number. |
| Block 4 | The full name and location address of the organisation issuing the statement. This Block may be pre-printed. Logos etc. are permitted if the logo can be contained within the Block. |
| Block 5 | The aircraft type in full as defined in the type-certificate and its associated data sheet. |
| Block 6 | The type-cel1ificate reference numbers and issue for the subject aircraft. |
| Block 7 | If the aircraft is registered then this mark will be the registration mark. If the aircraft is not registered then this will be such a mark that is accepted by DGCA. |
| Block8 | The identification number assigned by the manufacturer for control and traceability and product support. This is sometimes referred to as a Manufacturers Serial No or Constructors No. |
| Block9 | The engine and propel1er type(s) in full as defined in the relevant type-certificate and its associated data sheet. Their manufacturer identification No and associated location should also be shown. |
| Block 10 | Approved design changes to the Aircraft Definition. |
| Block 11 | A listing of al1 applicable airworthiness directives (or equivalent) and a declaration of compliance, together with a description of the method of compliance on the subject individual aircraft including products and instal1ed parts, appliances and equipment. Any future compliance requirement time should be shown. |

| | |
|---|---|
| Block 12 | Approved unintentional deviation to the approved type design sometimes referred to as concessions, divergences, or non-conformances. |
| Block 13 | Only agreed exemptions, waivers or derogations may be included here. |
| Block 14 | Remarks. Any statement, information, particular data or limitation which may affect the airworthiness of the aircraft. If there is no such information or data, state: 'NONE'. |
| Block 15 | Enter 'Certificate of Airworthiness', or 'Special Certificate of Airworthiness', or for the Certificate of Airworthiness requested. |
| Block 16 | Additional requirements such as those notified by an importing country should be noted in this Block. |
| Block17 | Validity of the Statement of Conformity is dependent on full completion of al1 Blocks on the form. A copy of the flight test report together with any recorded defects and rectification details should be kept on file by the POA holder. The report should be signed as satisfactory by the appropriate certifying staff and a flight crew member, e.g., test pilot or flight test engineer. The flight tests performed are those defined under the control of the quality system, as established by 21.139 in particular 21.139(b)(1)(vi), to ensure that the aircraft controls with the applicable design data and is in condition for safe operation.<br>The listing of items provided (or made available) to satisfy the safe operation aspects of this statement should be kept on file by the POA holder. |
| Block 18 | The Statement of Conformity may be signed by the person authorised to do so by the production approval holder in accordance with 2l.145(d). A rubber stamp signature should not be used. |
| Block 19 | The name of the person signing the certificate should be typed or printed in a legible form. |
| Block 20 | The date the Statement of Conformity is signed should be given. |
| Block 21 | DGCA approval reference of the POA holder should be quoted. |



# GOVERNMENT OF INDIA
# DIRECTORATE GENERAL OF CIVIL AVIATION

## CERTIFICATE OF RELEASE TO SERVICE

[APPROVED PRODUCTION ORGANISATION NAME]

**Production organisation approval Reference:**

**Certificate of release to service in accordance with 21.163(d).**

Aircraft:…… .. Type:……..Constructor No /

Registration…… has been maintained as specified

in Work Order: ……

….

Brief description of work performed:

**Certifies** that the work specified was carried out in accordance with 2l.163(d) and in respect to that work *the* aircraft is considered ready for release to service and therefore is in a condition for safe operation.

Certifying Staff (name):

(signature):

Location:

Date: ….-…… (day. month. year).

FORM CA-53 - CERTIFICATE OF RELEASE TO SERVICE

COMPLETION INSTRUCTONS

The Block BRIEF DESCRIPTION OF WORK PERFORMED appearing in FORM CA-53 should include reference to the approved data used to perform the work.

The Block LOCATION appearing in FORM CA-53 refers to the location where the maintenance has been performed, not to the location of the facilities of the organisation (if different).

## FORM CA-55 - PRODUCTION ORGANISATION APPROVAL CERTIFICATE

**DGCA**

**APPROVAL CERTIFICATE**

REFERENCE: DGCA.G.XXXX

Pursuant to the Indian Regulations in force and subject to the conditions specified below,
DGCA hereby certifies

**Company Name**
**Address**

as a

PRODUCTION ORGANISATION

approved according to Car 21, Subpart G

CONDITIONS

1. The approval is limited to that specified in the enclosed Terms of Approval; and

2. This approval requires compliance with the procedures specified in the Production Organisation Exposition; and

3. This approval is valid whilst the approved production organisation remains in compliance with Car 21, Subpart G.

| | |
|---|---|
| Date of original issue: Date of this issue: | Signed: |
| | |
| | For DGCA |

## PRODUCTION ORGANISATION APPROVAL CERTIFICATE

| DGCA | **Terms of Approval** | TA: DGCA.G.XXXX |
|---|---|---|

This document is part of Production Organisation Approval Number DGCA.G.XXXX issued to

Company name

Section 1. **SCOPE OF WORK:**

PRODUCTION OF PRODUCTS / CATEGORIES

For details and limitations refer to the Production Organisation Exposition, Section xxx

Section 2. **LOCATIONS:**

Section 3. **PRIVILEGES**:

The Production Organisation is entitled to exercise, within its Terms of Approval and in accordance with the procedures of its Production Organisation Exposition, the privileges set forth in 21.163. Subject to the following:

Prior to approval of the design of the product a Form CA-1 may be issued only for conformity purposes.

A Statement of Conformity may not be issued for a non approved aircraft.

Maintenance may be performed, until compliance with maintenance regulations is required, in accordance with the Production Organisation Exposition Section xxx.

| Date of original issue: Date of this issue: | Signed:<br><br>For DGCA |
|---|---|

**FORM CA-60 – Application for agreement of production under CAR 21 Subpart F**

| **Form CA-60**<br>**Application for agreement of production under CAR 21 Subpart F** | |
|---|---|
| **DGCA** | |
| 1. Registered name and address of the applicant: | |
| 2. Trade name (if different): | |
| 3. Location(s) of manufacturing activities: | |
| 4. Description of the manufacturing activities under application | |
| a) Identification (TC, P/N , … as appropriate): | |
| b) Termination (No. of units, Termination date, …): | |
| 5. Evidence supporting the application, as per 21.124(b): | |
| 6. Links/arrangements with design approval holder(s)/design organisation(s) where different from Block 1. : | |
| 7. Human resources: | |
| 8. Name of the person signing the application: | |
| _____.<br>Date | _____.<br>Signature |

**Note :**

1. **Applicants for agreement of production under CAR 21 Subpart F, will be charged as follows:**
   (i) fifty employees : Rs.25,000/-
   (ii) more than fifty and upto two hundred employees: Rs.50,000/-
   (iii) more than 200 employees : Rs.1,00,000/-
2. **The fees for renewal of agreement shall be fifty percent of that of the new agreement as above.**

Block 1: The name of the applicant must be entered. For legal entities the name must be as stated in the register of the Indian Companies Registration Office. In this case a copy of the entry in the register of the Indian Companies Registration Office must be provided to the Competent Authority.

Block 2: State the trade name by which the applicant is known to the public if different from the information given in Block 1. The use of a logo may be indicated in this Block.

Block 3: State all locations of manufacturing activities that are covered by the application. Only those locations must be stated that are directly under the control of the applicant stated in Block 1.

Block 4: This Block must include further details of the manufacturing activities under the approval for the addresses indicated in Block 3. The Block "Identification" must indicate the products, parts, appliances or material intended to be produced, while the Block "Termination" must address any information on the limitation of the activity, e.g., by stating the intended number of units to be manufactured or the expected date of completion of the manufacturing activities.

Block 5: This Block must state evidence supporting the determination of applicability as stated in 21.121. In addition an outline of the manual required by 21.125A(b) must be provided with the application.

Block 6: The information entered here is essential for the evaluation of eligibility of the application. Therefore special attention must be given concerning the completion of this Block either directly or by reference to supporting documentation in relation to the requirements of 21.122 and AMC 21.122.

Block 7: The information to be entered here must reflect the number of staff or in case of an initial approval the intended number of staff, for the manufacturing activities under this application and therefore must include also any associated administrative staff.

Block 8: State the name of the person authorised to sign the application.

**LETTER OF AGREEMENT**

**Directorate General of Civil Aviation**

[NAME OF THE APPLICANT]
[TRADE NAME (if different)]
[FULL ADDRESS OF THE APPLICANT]

Date (Day, Month, Year)
Reference: [DGCA].F.[XXX]

Subject: PRODUCTION WITHOUT POA, LETTER OF AGREEMENT

Dear Sirs,

Your production inspection system has been evaluated and found to be in compliance with Car 21, Subpart F.

Therefore, subject to the conditions specified below, we agree that showing of conformity of products, parts and appliances mentioned below may be done under Car 21, Subpart F.

| **No of Units** | **P/N** | **S/N** |
|---|---|---|
| AIRCRAFT | | |
| PARTS | | |

The following conditions are applicable to this agreement:

1. It is valid whilst [Company Name] remains in compliance with CAR 21, Subpart F.

2. It requires compliance with the procedures specified in [Company Name] Manual Ref. / Issue date …… .

3. It terminates on ……..

4. The Statement of Conformity issued by [Company Name] under the provisions of 21.130 shall be validated by the issuing authority of this letter of agreement in accordance with the procedure of the above referenced Manual.

5. Mr./ Ms …….. is hereby authorized to validate the Statement of Conformity/ Authorised Release Certificate.

6. [Company Name] shall notify the issuing authority of this letter of agreement immediately of any changes to the production inspection system that may affect the inspection, conformity, or airworthiness of the products and parts listed in this letter.

Date and Signature

GOVERNMENT OF INDIA
DIRECTORATE GENERAL OF CIVIL AVIATION

**FORM CA-80A - Application for Design Organisation Approval (DOA)/ renewal of DOA under CAR 21, Subpart JA**

| Application for Design Organisation Approval (DOA)/ renewal of DOA under CAR 21, Subpart JA | |
|---|---|
| **1. Applicant** | |
| 1.1 Company Name, Company registration number, Address; Telephone, Fax and E-mail of Contact Person & Authorised person | *[provide copy of registration with national Companies register]* |
| **2. Scope** | |
| Design in accordance with applicable type-certification basis and environmental protection requirements | |
| 2.1 Product Type | [See instructions on reverse page] |
| 2.2 Activity(ies) | [See instructions on reverse page] |
| 2.3 Technical Field(s) | [See instructions on reverse page] |
| **3. List of products** (only for DOA applications related to TC and ITSOA for APU) | |
| **4. Limitations** | |
| **5. Additional information** | |
| **6. Fees information** | |
| 1. Applicants for Design Organisation Approval (DOA) under CAR 21, Subpart JA, will be charged as per Rule 133C of the Aircraft Rules, 1937 through online web portal https://bharatkosh.gov.in/. Provide copy of receipt with Transaction Reference No.<br>2. The fees for renewal of DOA shall be fifty percent of that of the new DOA as above.The fee shall be paid through online web portal https://bharatkosh.gov.in/ as per Rule 133C of the Aircraft Rules, 1937. Provide copy of receipt with Transaction Reference No. | |
| **7. Outline of data required under CAR 21.A243** | |
| The applicant shall provide the draft handbook, or an outline, including company flow-charts, description and information on design activities and organisation of partners or subcontractors. | |
| **8. Applicant's declaration** | |
| I agree to pay the fees levied by DGCA in respect of the issuance/renewal of a DOA certificate and am aware of the consequences of non-payment. | |
| **9. Signature** | |

| Date | Name of Chief Executive or Authorised Representative | Signature |
|---|---|---|
| | | |

This Application, together with :
- a copy of the registration with Indian Companies register,
- attachment "Information required for calculation of fee category",
- the documents listed under § 7 above,

should be sent to:

Director (Aircraft Engineering Directorate), Directorate General of Civil Aviation,
Opposite Safdarjung Airport, New Delhi- 110 003, India, Telephone: 91-11-24623211

See reverse for information

Information to be entered into application for DOA form:

The use of this form is required to enable DGCA to process applications without undue delay. The individual fields of the application form may be varied in size to allow entry of all required information. The application should be in English language.

Field 1.1: enter the name of the legal entity making the application, address; enter the name, telephone, fax and e-mail of contact person for this application and authorized person

Fields 2.1-2.3 identify the product type, the activity/ies for each product type and the related technical field(s) for each activity, in accordance with the lists below, add lines as appropriate depending on number of activities and related technical fields; fill in a separate table (section 2.1-2.3) for each product type (copy and paste section as necessary)

Field 2.1: Product Type

- Large aeroplane
- Small aeroplane
- Sailplane/powered Sailplane
- Very light aeroplane
- Small rotorcraft
- Large rotorcraft
- Very light rotorcraft
- Turbine engine
- Piston engine
- Auxiliary Power Unit (APU)
- Propeller

Field 2.2: Activity

- Type Certificates/ITSOA for APU
- Supplemental Type Certificates/ITSOA for APU
- Changes to type design (major and minor) by TC holders and continued airworthiness
- Repairs (major and minor)
- Minor changes only
- Minor repairs only

Field 2.3: Technical Field

- All (in case of Type Certificates)
- Avionics
- Installation of avionics equipment
- Structure
- Performance
- Environmental systems
- Hydro mechanical systems
- Electrical systems
- Cabin interiors
- Galleys or other interiors equipment
- Powerplant/Fuel system
- Software
- Transmissions
- Noise
- FADEC (Full Authority Digital Engine Control)
- Non critical engine parts
- Thrust reversers

Field 3: list all products for which TC application (or ITSOA for APU) is requested

Field 4: specify as necessary appropriate limitations, such as :

- Software level
- Primary/Secondary structure
- Others (to be specified)

Field 5: add information on schedule for Type Certificate, STC or other design approval

Field 7: See relevant subparts of CAR 21.

http://www.dgca.nic.in



# GOVERNMENT OF INDIA
# DIRECTORATE GENERAL OF CIVIL AVIATION

**FORM CA-80B - Application for Design Organisation Approval (DOA)/ renewal of DOA under CAR 21, Subpart JB**

## Application for Design Organisation Approval (DOA)/ renewal of DOA under CAR 21, Subpart JB

**1. Applicant**

| | |
|---|---|
| 1.1 Company Name, Company registration number, Address; Telephone, Fax and E-mail of Contact Person & Authorised person | *[provide copy of registration with national Companies register]* |

**2. Scope**

Design in accordance with applicable regulations for the parts/ appliances as applicable.

**3. Description of parts/ appliances**

**4. Limitations**

**5. Additional information**

**6. Fees information**

1. Applicants for Design Organisation Approval (DOA) under CAR 21, Subpart JB, will be charged as per Rule 133C of the Aircraft Rules, 1937 through online web portal https://bharatkosh.gov.in/. Provide copy of receipt with Transaction Reference No.
2. The fees for renewal of DOA shall be fifty percent of that of the new DOA as above. The fee shall be paid through online web portal https://bharatkosh.gov.in/ as per Rule 133C of the Aircraft Rules, 1937. Provide copy of receipt with Transaction Reference No.

**7. Outline of data required under 21.B243**

The applicant shall provide the draft handbook, or an outline, including company flow-charts, description and information on design activities and organisation of partners or subcontractors.

**8. Applicant's declaration**

I agree to pay the fees levied by DGCA in respect of the issuance/renewal of a DOA certificate and am aware of the consequences of non-payment.

**9. Signature**

| Date | Name of the Authorised Representative | Signature |
|---|---|---|
| | | |

This Application, together with :

- a copy of the registration with Indian Companies register,
- attachment "Information required for calculation of fee category",
- the documents listed under § 7 above,

should be sent to:

Director (Aircraft Engineering Directorate), Directorate General of Civil Aviation,
Opposite Safdar Jung Airport, New Delhi- 110 003, India, Telephone: 91-11-24623211

Information to be entered into application for DOA form:

The use of this form is required to enable DGCA to process applications without undue delay. The individual fields of the application form may be varied in size to allow entry of all required information. The application should be in English language.

Field 1.1: enter the name of the legal entity making the application, address; enter the name, telephone, fax and e-mail of contact person for this application and authorized person

Fields 2 identify the scope of approval of parts/appliances type.

Field 3: Description of the types of parts/ appliances.

Field 4: specify as necessary appropriate limitations.

Field 5: add information as necessary.

Field 7: See relevant subparts of CAR 21.

http://www.dgca.nic.in

GOVERNMENT OF INDIA
DIRECTORATE GENERAL OF CIVIL AVIATION

**FORMCA-81-Application for Alternative Procedures to Design Organisation Approval**

# Application for Alternative Procedures to Design Organisation Approval (ADOA)

**1. Applicant**

| | |
|---|---|
| 1.1 Company Name, Company registration number, Address; Telephone, Fax and E-mail of Contact Person & Authorised person | |

**2. Scope**

Design approval case for which the Company applied for alternative procedures to DOA :

| 2.1 Eligibility | | 2.2 Description of case |
|---|---|---|
| ☐ TC | *as per 21.14(b)* | *name and category of product* |
| ☐ STC | *as per 21.112B(b) and GM 21.112B(b)* | *description and products on which it applies* |
| ☐ Major repair | *as per 21.432B(b)* | *description and products on which it applies* |
| ☐ ITSO | *as per 21.602B(c)(2)* | *provide ITSO numbers and titles* |

Important note: An organisation that already has demonstrated its capability under alternative procedures to DOA must re-apply only if the previous scope is proposed to be extended.

**3. Reference of Procedures describing the alternative procedures in detail to Design Organisation Approval.**

| ***Reference*** | ***Title*** | ***Issue/Date*** |
|---|---|---|
| | | |

**4. Additional information**

**5. Fees information**

1.Applicants for Alternative Procedure to Design Organisation Approval (ADOA) under CAR 21, Subpart JA, will be charged as per Rule 133C of the Aircraft Rules, 1937 through online web portal https://bharatkosh.gov.in/. Provide copy of receipt with Transaction Reference No.
The fee shall be paid through online web portal https://bharatkosh.gov.in/ as per Rule 133C of the Aircraft Rules, 1937. Provide copy of receipt with Transaction Reference No.

**6. Applicant's declaration**

I agree to pay the fees levied by DGCA in respect of the issuance of a DGCA finding of compliance and am aware of the consequences of non-payment.

**7. Signature**

| Date | Name of Chief Executive or Authorised Representative | Signature |
|---|---|---|

This Application, together with :
- a copy of the registration with Indian Companies register,
- the documents listed under § 3 above, if available,

should be sent to:
Director (Aircraft Engineering Directorate), Directorate General of Civil Aviation,
Opposite Safdarjung Airport, New Delhi- 110 003, India, Telephone: 91-11-24623211

Information to be entered into application for alternative procedures to DOA form:

The use of this form is required to enable DGCA to process applications without undue delay. The individual fields of the application form may be varied in size to allow entry of all required information. The application should be in English language.

Field 1.1: enter the name of the legal entity making the application, address; enter the name, telephone, fax and e-mail of contact person for this application and authorized person

Field 2.1: identify eligibility by ticking the related checkbox and indicate which case applies

Field 2.2: add description of case indicated under 2.1. Categories to be used are the categories described in 21.14(b).

Field 3: if available, provide the procedures; add rows if necessary

Field 4: add information on schedule for Type Certificate, STC or other design approval. Mention that it is a change to existing procedures, when the application is related to the approval of updated procedures.

GOVERNMENT OF INDIA
DIRECTORATE GENERAL OF CIVIL AVIATION

**FORM CA-82A - Application for Significant Changes to Design Organisation Approval (DOA) under CAR 21, Subpart JA**

| Application for Significant Changes to Design Organisation Approval (DOA) under CAR 21, Subpart JA | | |
|---|---|---|
| **1. Applicant** | | |
| 1.1 Applicant's Design Organisation Approval (DOA) Number | | |
| 1.2 Company Name, Company registration number, Address; Telephone, Fax and E-mail of Contact Person & Authorised person | *[provide copy of registration with national Companies register]* | |
| **2. Identification of significant change(s)** | | |
| 2.1 Changes to the organisation (ref. 21.A247 and GM 21.A247) | | |
| 2.2 Changes to the scope | | |
| Product Type | [See instructions on reverse page] | |
| Activity(ies) | [See instructions on reverse page] | |
| Technical Field(s) | [See instructions on reverse page] | |
| 2.3 Changes to the list of product types | | |
| 2.4 Changes to limitations | | |
| 2.5 Changes to the privilege(s) | | |
| **3. Additional information related to the significant changes** | | |
| **4. Outline of data required under 21.A243** | | |
| The applicant shall provide the draft revised handbook, or an outline, with the information related to the significant changes, including company flow-charts, description and information on design activities and organisation of partners or subcontractors. | | |
| **5. Fees information** | | |
| Applicants for significant changes to Design Organisation Approval (DOA) under CAR 21, Subpart JA, will be charged as per Rule 133C of the Aircraft Rules, 1937 through online web portal https://bharatkosh.gov.in/. Provide copy of receipt with Transaction Reference No.<br>The fee shall be paid through online web portal https://bharatkosh.gov.in/ for significant changes pertaining to number of employees, when it increases beyond the limit as specified in Rule 133C of the Aircraft Rules, 1937 and extension of scope of approval as specified in Rule 133C of the Aircraft Rules, 1937. Provide copy of receipt with Transaction Reference No.(if applicable). | | |
| **6. Applicant's declaration** | | |
| I agree to pay the fees levied by DGCA in respect of any surveillance activities related to my DOA certificate and am aware of the consequences of non-payment. | | |
| **7. Signature** | | |
| Date | Name of Chief Executive or Authorised Representative | Signature |
| This Application together with a copy of the registration with Indian Companies register and the documents listed under § 4 above should be sent to: Director (Aircraft Engineering Directorate), Directorate General of Civil Aviation, Opposite Safdarjung Airport, New Delhi- 110 003, India, Telephone: 91-11-24623211 | | |

Information to be entered into application for significant changes to DOA form:

The use of this form is required to enable DGCA to process applications without undue delay. The individual fields of the application form may be varied in size to allow entry of all required information. The application should be in English language

Field 1.1: enter your DGCA DOA number

Field 1.2: enter the name of the legal entity making the application, address; enter the name, telephone, fax and e-mail of contact person for this application and authorized person

Field 2.1: add description of changes to the organisation. See "AMC and GM to CAR 21" under the respective link of the DGCA website: http://www.dgca.nic.in

Field 2.2: indicate only modifications to current scope requested regarding the product types, the activities and/or the technical fields, in accordance with the lists below, add lines as appropriate depending on number of activities and related technical fields concerned by modification; fill in a separate table for each product type concerned by the modification (copy and paste section as necessary)

Product Type

- Large aeroplane
- Small aeroplane
- Sailplane/powered Sailplane
- Very light aeroplane
- Small rotorcraft
- Large rotorcraft
- Very light rotorcraft
- Turbine engine
- Piston engine
- Auxiliary Power Unit (APU)
- Propeller

Activity

- Type Certificates/ITSOA for APU
- Supplemental Type Certificates/ITSOA for APU
- Changes to type design (major and minor) by TC holders and continued airworthiness
- Repairs (major and minor)
- Minor changes only
- Minor repairs only

Technical Field

- All (in case of Type Certificates)
- Avionics
- Installation of avionics equipment
- Structure
- Performance
- Environmental systems
- Hydro mechanical systems
- Electrical systems
- Cabin interiors
- Galleys or other interiors equipment
- Powerplant/Fuel system
- Software
- Transmissions
- Noise
- FADEC (Full Authority Digital Engine Control)
- Non critical engine parts
- Thrust reversers

Field 2.3: indicate new product(s) to be added

Field 2.4: indicate changes in limitations

Field 2.5: indicate new privilege(s) to be added

**IMPORTANT NOTE:**

If changes mentioned in 2.1, 2.2 and 2.4 are affecting the category of DOA, send the attachment to this Form 82A with the updated information.

Field 3: add information on schedule for any design approval

Field 4: See CAR 21 for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production.

GOVERNMENT OF INDIA
DIRECTORATE GENERAL OF CIVIL AVIATION

**FORM CA-82B - Application for Significant Changes to Design Organisation Approval (DOA) under CAR 21, Subpart JB**

| Application for Significant Changes to Design Organisation Approval (DOA) under CAR 21, Subpart JB | |
|---|---|
| **1. Applicant** | |
| 1.1 Applicant's Design Organisation Approval (DOA) Number | |
| 1.2 Company Name, Company registration number, Address; Telephone, Fax and E-mail of Contact Person & Authorised person | *[provide copy of registration with national Companies register]* |
| **2. Identification of significant change(s)** | |
| Changes in the organisation (ref. CAR 21.B247 and GM 21.B247), scope, list of parts/ appliances, limitations, privilege(s) etc. | |
| **3. Additional information related to the significant changes** | |
| **4. Outline of data required under 21.B243** | |
| The applicant shall provide the draft revised handbook, or an outline, with the information related to the significant changes, including company flow-charts and, as relevant, description and information on design activities and organisation of partners or subcontractors. | |
| **5. Fees information** | |
| Applicants for significant changes to Design Organisation Approval (DOA) under CAR 21, Subpart JB, will be charged as per Rule 133C of the Aircraft Rules, 1937 through online web portal https://bharatkosh.gov.in/. Provide copy of receipt with Transaction Reference No. | |
| **6. Applicant's declaration** | |
| I agree to pay the fees levied by DGCA in respect of any surveillance activities related to my DOA certificate and am aware of the consequences of non-payment. | |
| **7. Signature** | |

| Date | Name of Chief Executive or Authorised Representative | Signature |
|---|---|---|

This Application together with a copy of the registration with Indian Companies register and the documents listed under § 4 above should be sent to:

Director (Aircraft Engineering Directorate), Directorate General of Civil Aviation,
Opposite Safdarjung Airport, New Delhi- 110 003, India, Telephone: 91-11-24623211

See reverse for information

Information to be entered into application for significant changes to DOA form:

The use of this form is required to enable DGCA to process applications without undue delay. The individual fields of the application form may be varied in size to allow entry of all required information. The application should be in English language

Field 1.1: enter your DGCA DOA number

Field 1.2: enter the name of the legal entity making the application, address; enter the name, telephone, fax and e-mail of contact person for this application and authorized person

Field 2

- add description of changes to the organisation. See "AMC and GM to CAR 21" under the respective link of the DGCA website: http://www.dgca.nic.in
- indicate only modifications to current scope requested regarding the parts and appliances.
- indicate new product(s) to be added
- indicate changes in limitations
- indicate new privilege(s) to be added

**IMPORTANT NOTE:**
If changes mentioned in 2 are affecting the category of DOA, send the attachment to this Form 82B with the updated information.

Field 3: add information on schedule for any design approval

Field 4: See CAR 21 for the airworthiness and environmental certification of aircraft and related products, parts and appliances, as well as for the certification of design and production.

**FORM CA-22 - Application for Special Flight Permit**

| **Application for Special Flight Permit** | | |
|---|---|---|
| 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<br>*[Use terminology of 21.701(a) and add any additional information for accurate description of the purpose, e.g. place, itinerary, duration…]*<br><br>*[For an applicatio10due to a change of purpose (ref. 21.713):reference to initial request and description of new purpose]* | | |
| 7. Expected target date(s) for the flight(s) and duration | | |
| 8. Aircraft configuration as relevant for the Special Flight Permit<br>8.1 The above aircraft for which a Special Flight Permit is requested is defined in<br>*[add reference to the document(s) identifying the configuration of the aircraft. Same as required in AMC 21.A263(c)(6) or AMC 21.709(b) application form, box 5]*<br><br>8.2 The aircraft is in the following situation related to its maintenance schedule:<br>*[Describe status]* | | |
| 9. Approval of flight conditions *[if not available at the time of application, indicate reference of request for approval]*<br><br>*[Reference to: DGCA approval]* | | |
| 10. Date | | 11. Name and signature<br>*[Authorised signatory]* |

Note: The fee shall be paid through online web portal https://bharatkosh.gov.in/ for issue of Special Flight Permit as specified in Rule 62(1)(D)(vi) of the Aircraft Rules, 1937. Provide copy of receipt with Transaction Reference No.

**FORM CA-21 - FLIGHT CONDITIONS FOR A SPECIAL FLIGHT PERMIT – APPROVAL FORM**

<table>
<tr><td colspan="2">FLIGHT CONDITIONS FOR A SPECIAL FLIGHT PERMIT – APPROVAL FORM</td></tr>
<tr><td>1. Applicant<br>[Name of organisation providing the flight conditions and associated substantiations]</td><td>2. Approval form number.<br>Issue:<br>[number and issue, for traceability purpose]</td></tr>
<tr><td>3. Aircraft manufacturer/type</td><td>4. Serial number(s)</td></tr>
<tr><td colspan="2">5. Purpose<br><br>[Purpose in accordance with 21.701(a)]</td></tr>
<tr><td colspan="2">6. Aircraft configuration<br>The above aircraft for which a Special Flight Permit is requested is defined in [add reference to the document(s) identifying the configuration of the aircraft]<br>[For change(s) affecting the initial approval form: description of change(s). This form must be re-issued]</td></tr>
<tr><td colspan="2">7. Substantiations<br>[References to the document(s) justifying that the aircraft (as described in 5.) can perform the intended flight(s) safely under the defined conditions or restrictions.]<br>[For change(s) affecting the initial approval form: reference(s) to additional substantiation(s). This form must be re-issued]</td></tr>
<tr><td colspan="2">8. Conditions/Restrictions<br>The above aircraft must be used with the following conditions or restrictions:<br>[Details of these conditions/restrictions, or reference to relevant document, including specific maintenance instructions and conditions to perform these instructions)</td></tr>
<tr><td colspan="2">9. Statement<br>The flight conditions have been established and justified in accordance with 21.708. The aircraft as defined in block 6 above has no features and characteristics making it unsafe for the intended operation under the identified conditions and restrictions.</td></tr>
<tr><td>10. Date of issue</td><td>11. Name and signature<br>[Autho<br><br><br>rised signatory]</td></tr>
</table>

## DIRECTOR GENERAL OF CIVIL AVIATION

# EXPORT CERTIFICATE OF AIRWORTHINESS

This certifies that the product identified below and more particularly described in Specification(s) of the Director General of Civil Aviation, Numbered ..... has been examined and as of the date of this Certificate, is considered airworthy in accordance with a comprehensive and detailed airworthiness code/requirement of the Indian Government, and is in compliance with these special requirements of the importing country filed with the Indian Government, except as noted below. This certificate in no way attests to compliance with any agreements or contracts between the sender and purchaser, nor does it constitute authority to operate an aircraft.

This Export C of A does not constitute authority for flight.

PRODUCT: ENGINE INSTALLED:

MANUFACTURER:

MODEL:

SERIAL NO.: PROPELLER INSTALLED:

NEW ..... NEWLY OVERHAULED ....

USED AIRCRAFT:

COUNTRY TO WHICH EXPORTED:

EXCEPTIONS:

for Director General of Civil Aviation

New Delhi
Dated

* For complete aircraft list applicable specification or Type Certificate Data Sheet numbers for the aircraft, engine, and propellers. Applicable specifications or Type Certificate Data Sheet, if not attached to this export certificate, will have been forwarded to the appropriate governmental office of the importing country.

**TYPE CERTIFICATE DATA SHEET (TCDS) FORMAT FOR AIRPLANE**

| | |
|---|---|
| DIRECTOR GENERAL OF CIVIL AVIATION<br>TYPE CERTIFICATE DATA SHEET | TCDS NUMBER<br>REVISION:<br>DATE:<br>Name of Company:<br>MODELS: |

**TYPE CERTIFICATE (TC) HOLDER** :

- **Model**
  1. Engines:
  2. Fuel:
  3. Engine Ratings & Operating Limits:
  4. Airspeed Limits:
  5. CG Range:
  6. Maximum Weights:

- **PERTINENT DATA**
  1. Minimum Crew:
  2. Maximum Passengers:
  3. Maximum Baggage/Cargo:
  4. Fuel and Oil Capacities:
  5. Leveling Means:
  6. Datum:
  7. MAC:
  8. Control Surface
  9. Movements:

- Certification Basis:
- Production Basis
- Required Equipment:
- Other Information

**TYPE CERTIFICATE DATA SHEET (TCDS) FORMAT FOR ROTORCRAFT**

| | |
|---|---|
| DIRECTOR GENERAL OF CIVIL AVIATION<br>TYPE CERTIFICATE DATA SHEET | TCDS NUMBER<br>REVISION:<br>DATE:<br>Name of Company:<br>MODELS: |

**TYPE CERTIFICATE (TC) HOLDER** :

## I. MODELS

1. Engine
2. Fuel
3. Engine limits
4. Carburetor
5. carburetor setting
6. Rotor limits
7. & operational Power engine limits
8. C.G. range
9. Empty weight C.G. range
10. Maximum weight
11. No. of seats
12. Maximum baggage
13. Fuel capacity
14. Oil capacity
15. Rotor blade & control movements
16. Serial Nos.
17. Required equipment
18. Certification Basis
19. Production Basis
20. Equipment:
21. Other Information

**TYPE CERTIFICATE DATA SHEET (TCDS) FORMAT FOR PISTON ENGINE**

| | |
|---|---|
| DIRECTOR GENERAL OF CIVIL AVIATION<br>TYPE CERTIFICATE DATA SHEET | TCDS NUMBER<br>REVISION:<br>DATE:<br>Name of Company:<br>MODELS: |

**TYPE CERTIFICATE (TC) HOLDER** :

**I. MODELS**

1. TYPE

2. RATINGS

   - Takeoff power (5 min.) :
     (sea level pressure altitude)

   - Max. continuous power :
     (sea level pressure altitude)

3. OIL pressure:

   Max. oil-inlet temperature (° C):
   Max. cylinder-head temperature (° C) :

4. COOLANT
   temperature:
   specification:

5. FUEL pressure: (see note 2)
   (at inlet to carburetor)

6. CARBURETOR

7. FUEL PUMP

8. IGNITION SYSTEM
   Ignition timing

9. SPARK PLUGS

10. ALTERNATOR, external

11. GENERATOR, INTEGRATED

12. STARTER

13. VACUUM PUMP

14. ENGINE SPEED MEASUREMENT (RPM)

15. DISPLACEMENT
16. BORE
17. STROKE
18. COMPRESSION RATIO
19. PROPELLER ROTATION
20. PROPELLER FLANGE
21. GEAR REDUCTION RATIO (CRANKSHAFT TO PROP)
22. PROPELLER CONTROL
23. GOVERNOR
24. OPERATING INSTRUCTIONS
25. CERTIFICATION BASIS
26. PRODUCTION BASIS
27. OTHER INFORMATION

**TYPE CERTIFICATE DATA SHEET (TCDS) FORMAT FOR TURBO-PROPELLER PROPULSION ENGINE**

| | |
|---|---|
| DIRECTOR GENERAL OF CIVIL AVIATION<br>TYPE CERTIFICATE DATA SHEET | TCDS NUMBER<br>REVISION:<br>DATE:<br>Name of Company:<br>MODELS: |

**TYPE CERTIFICATE (TC) HOLDER** :

**I. MODELS**

1. TYPE

2. RATINGS

Maximum continuous at sea level

- Equivalent shaft horsepower
- Shaft Horsepower
- Thrust, pounds
- Output, rpm (maximum)
- Gas gen. rpm (maximum)

Takeoff (5 min. at sea level)

- Equivalent shaft horsepower
- Shaft horsepower
- Thrust, pounds
- Output, rpm (maximum)
- Gas gen., rpm (maximum)

Alternate takeoff (5 min. at sea level)

- Equivalent shaft horsepower
- Shaft horsepower
- Thrust, lbs.
- Output, rpm (maximum)
- Gas gen. rpm (maximum)

Maximum Reverse

- Shaft horsepower
- Output, rpm (maximum)

3. Limitations

Maximum Continuous

- Maximum inter-turbine temp (ITT)
- Maximum air inlet temp (AIT) for rated power

Takeoff (5 mins)

- Maximum inter turbine temp (ITT),
- Maximum air inlet temp(AIT)for rated power

Alternate takeoff (10 min)

- Maximum inter turbine temp (ITT)
- Maximum air inlet temp (AIT)for rated power (AIT)

Starting (5 secs)

- Maximum inter turbine temp (ITT)

4. Fuel Type
5. Oil Type
6. Equipment
7. Dimensions

    - Diameter
    - Length
    - Weight
    - Standard rotation
    - Reverse rotation
    - Reduction Ratio (Np:Nf)

8. Certification basis
9. Production basis
10. Other information

**TYPE CERTIFICATE DATA SHEET (TCDS) FORMAT FOR TURBO-FAN PROPULSION ENGINE**

| | |
|---|---|
| DIRECTOR GENERAL OF CIVIL AVIATION<br>TYPE CERTIFICATE DATA SHEET | TCDS NUMBER<br>REVISION:<br>DATE:<br>Name of Company:<br>MODELS: |

**TYPE CERTIFICATE (TC) HOLDER**:

**I. MODELS**

1. TYPE

2. Static Thrust Ratings:

    - Max. Continuous at Sea Level, lbs.
    - Takeoff at Sea Level, lbs.

3. COMPONENTS
    - Fuel control
    - Fuel pump
    - Ignition system
    - Igniter plugs

4. Principal Dimensions
5. Weight, Dry, Pounds (maximum):
6. Fuel
7. Oil
8. Certification Basis
9. Production Basis
10. Other Information

**TYPE CERTIFICATE DATA SHEET (TCDS) FORMAT FOR PROPELLER**

| | |
|---|---|
| DIRECTOR GENERAL OF CIVIL AVIATION<br>TYPE CERTIFICATE DATA SHEET | TCDS NUMBER<br>REVISION:<br>DATE:<br>Name of Company:<br>MODELS: |

**TYPE CERTIFICATE (TC) HOLDER**:

**I. MODELS**

1. Type
2. Engine Shaft
3. Hub Material
4. Blade Material
5. No. of Blades
6. Hubs Eligible
7. Blades Eligible
    - Maximum Continuous

      HP

      RPM
    - Take-Off

      HP

      RPM
    - Diameter Limits
    - Approx. Max. Wt. Complete
8. Certification Basis
9. Production Basis
10. Other Information

**FORM CA-2001-AED – DEFICIENCY REPORTING FORM**

| 1. Name of the Organisation | 2. Reference no. | 3. Issue Date |
|---|---|---|
| | | |

| 4. Area of Surveillance | 5. Name of the Chief of Airworthiness | 6. Date of Audit |
|---|---|---|
| | | |

| 7. Non-Conformity/ Deficiency Details |
|---|
| |

| 8. Level of Finding | 9. CAR/ DOC Reference | 10. Enclosures/ Evidences |
|---|---|---|
| | | |

| 11. Name of the Team Leader (Auditor) | 12. Signature of the Team Leader (Auditor) | 13. Target Date |
|---|---|---|
| | | |
| 14. Name of the Team Leader (Auditee) | 15. Signature of the Team Leader (Auditee) | |
| | | |

| **Response of the Organisation** |
|---|
| 16. Root Cause of the Deficiency |
| |
| 17. Corrective Action Details & Number of attached pages |
| |

| 18. Name of the Chief of Airworthiness | 19. Signature of the Chief of Airworthiness | 20. Date |
|---|---|---|
| | | |

| 21. Name of the Head of Design Organisation | 22. Signature of the Head of Design Organisation | 23. Date |
|---|---|---|
| | | |

| 24. Comments of the auditor with reference to the action taken |
|---|
| |

| 25. Signature of the Team Leader (Auditor) | | 26. Date |
|---|---|---|