

TECHNICAL GUIDANCE MATERIAL

for

Type Certification

SUBJECT: TECHNICAL GUIDANCE MATERIAL FOR TYPE CERTIFICATION (TC)

EFFECTIVE DATE: 02 April 2024

1. APPLICABILITY

This technical guidance material (TGM) is applicable to type certification projects of class I aeronautical products. i.e., aircraft, engines, and propellers. The process in this TGM applies to the product Type Certificate (TC) and amendment to TC.

Some of the steps or procedures in this TGM may not be applicable to all type certification projects since some of the steps or procedures may not be required due to the design features of the proposed product or the design features of the proposed change to the product.

2. PURPOSE

The purpose of this TGM is to provide a detailed guideline concerning the planning and conducting of a Type Certification activity for a Class I aeronautical product.

3. REQUIREMENTS

Part 21 Subpart 2 and 3 of the South African Civil Aviation Regulations provides the regulatory framework for the issuance of a TC for approval of major design changes to class 1 aeronautical products. This TGM therefore, provides guidance towards meeting compliance to regulatory requirements and applicable airworthiness design standards when carrying out TC projects.

4. REFERENCE

4.1 It is intended that the following reference material be used in conjunction with this TGM:

- i. Part 21 Subpart 1 of the SACARs, General;
- ii. Part 21 Subpart 2 of the SACARs, Type Certificates;
- iii. Part 21 Subpart 3 of the SACARs, Changes to Type Certificates;
- iv. SACATS 21, Airworthiness Requirements;
- v. Part 147 of the SACARs, Design Organisations for Products, Parts and Appliances;
- vi. SACATS 147, Design Organisations;
- vii. TGM on Part 147 approval of Design Organisation;
- viii. Part 187 of the SACARs, Fees and Charges;
- ix. EASA CS-22 (previously JAR-22), Certification Specifications for Sailplanes and Powered Sailplanes;

- x. Part 23 of the FAR, Normal, Utility, Acrobatic and Commuter category Aeroplanes;
- xi. Part 25 of the FAR, Transport Category Aeroplanes;
- xii. Part 27 of the FAR, Normal category Rotorcraft;
- xiii. Part 29 of the FAR, Transport Category Rotorcraft;
- xiv. Part 31 of the FAR, Manned Free Balloons;
- xv. Part 33 of the FAR, Aircraft Engines;
- xvi. Part 34 of the FAR, Fuel Venting and Exhaust Emission Requirements for Turbine Powered Aeroplanes;
- xvii. Part 35 of the FAR, Propellers; and
- xviii. Part 36 of the FAR, Noise Standards.

5. LIST OF DEFINITIONS AND ABBREVIATIONS USED IN THIS DOCUMENT

5.1 Definitions

TERMINOLOGY	DESCRIPTION
Accept	means the acknowledgement by SACAA that an item or plan should lead to compliance. Applicants' engineering reports are accepted;
Applicant	means the organization or individual that has the responsibility for the type design of the aircraft, engine or propeller and in whose name the type certificate will be issued;
Approve	means to make formal acknowledgement that a product or document meets the regulations and requirements. Within this instruction the word approve is limited to the Type Certificate, STC, Type Certificate Data Sheet (TCDS), Airworthiness Limitations section of the Instructions for Continuing Airworthiness (ICA), the Flight Manual and refers to approvals made by the Director of Civil Aviation.
Certification Basis	means the applicable airworthiness and environmental standards established as the basis by which the type design of an aeronautical product, or change to that type design, is approved or accepted. The certification basis may also include special conditions of airworthiness, findings of equivalent level of safety, and/or exemptions when determined by the State to apply to the type design;
Certification Plans	provides the project overview and identifies key technical aspects such as the certification basis, applicable means of compliance and relevant compliance documents;
Certification Team	means those individuals who have been assigned to a particular type certification project, including the applicant, SACAA personnel and personnel authorized by the SACAA;
Compliance Program (CP)	means a process to ensure that all the items in the compliance matrix are covered to ensure that the product certification basis is maintained;
Continuing Airworthiness	means the set of processes by which an aircraft, RPS, engine, propeller or
Engineering Inspection	Engineering inspections are physical inspections performed by a SACAA Certification Engineer. This inspection provides an opportunity to review an installation and its relationship to other installations on a product to determine compliance with airworthiness requirements that cannot be determined adequately from an evaluation of the technical data;
Finding of Compliance	means a determination that an element of the design satisfies the applicable standard of airworthiness;
Instructions for Continued Airworthiness	means an organisation that holds a type certificate, or equivalent document for an aircraft, RPS, engine or propeller type, issued by a Contracting State;

Level of Involvement (LOI)	means the specific involvement of the SACAA specialists as part of the certification program to make findings of compliance with specific requirements and accept associated data when satisfied that the design is compliant with applicable standards;
Means of Compliance	means the principle by which compliance is demonstrated. Examples are analysis (e.g. failure modes and effects analysis, flight performance data reduction, structural loads analysis, software evaluation etc.), test (e.g. flight test, ground test, fatigue test, simulation, fire or flammability test etc.), inspection or evaluation;
Organisation responsible for	means an organisation that holds a type certificate, or equivalent document for Type design
Project Manager	means the assigned individual from within the SACAA Certification Engineering Section, who manages the certification project. The applicant may also have a project manager, who will be referred to as the “applicant project manager” in this document;
Regulations	means these regulations and include any technical standards issued thereunder;
State of Design	means the State which has authority over the organisation responsible for the type design of an aircraft;
State of Manufacture	means a State having jurisdiction over an organisation responsible for the final assembly of an aircraft, RPS, engine or propeller;
State of Registry	
Type Certificate	means a document issued by a Contracting State to define the design of an aircraft, RPS, engine or propeller type and to certify that this design meets the appropriate airworthiness requirements of that State;
Type Design	means a set of data and information necessary to define an aircraft, RPS, engine or propeller type for the purpose of airworthiness determination;

5.1. Abbreviations

ABBREVIATION	MEANING
AED	Airworthiness Engineering Department
AFM	Aircraft Flight Manual
AFMS	Aircraft Flight Manual Supplement
AW	Airworthiness
C of A	Certificate of Airworthiness
CAR	Civil Aviation Regulation
CE	Certification Engineer
CMR	Certification Maintenance Requirements
COTS	Commercial Off the Shelf
CP	Compliance Program
DCA	Director of Civil Aviation
EMC	Electro Magnetic Compatibility
EMI	Electro Magnetic Interference
FAR	Federal Aviation Regulations
FCD	Fundamental Certification Documents
FHA	Functional Hazard Assessment
HIRF	High Intensity Radiated Field

ICA	Instructions for Continuing Airworthiness
ITBM	Initial Type Board Meeting
LOI	Level of Involvement
MOC	Means of Compliance
SACAA	South African Civil Aviation Authority
SACARs	South African Civil Aviation Regulation
SACATS	South African Civil Aviation Technical Standards
STC	Supplemental Type Certificate
TC	Type Certificate
TCDS	Type Certificate Data Sheet

6. BACKGROUND

6.1 Type certification of a Class 1 Aeronautical Product (aircraft, RPS, engine, propeller) involves a comprehensive type design examination to verify that the product complies with the applicable standards of airworthiness and environmental regulations pursuant to Part 21 of the SACARs. The scope of certification activities will depend on the category of product involved in the certification basis applied and the complexity of the product's design. Upon assurance that the design of the product complies with prescribed standards, the SACAA will issue a Type Certificate in the name of the individual or organization responsible for the type design. The Type Certificate includes the type design, the operating limitations, the TCDS, the applicable certification basis with which the SACAA recorded compliance and any other conditions or limitations specified by the SACAA.

6.2 All type designed Class I products (Part 21) such as aircraft, RPS, engines and propellers, as categorised, and prescribed under the Part 21, must be Type Certificated under Part 21. This document is meant to provide a consistent and standardised process that is expected at each phase of the Type certification. Details of each phase are covered in later sections of this document.

6.3 The certification process phases are:

6.3.1 Phase One: Application and Establishing the Certification Basis

6.3.2 Phase Two: Establish Means of Compliance and SACAA LOI

6.3.3 Phase Three: Demonstrate and Record Compliance

6.3.4 Phase Four: Certifying the Type Design

6.3.5 Phase Five: Post Type Certification Activities

7. PHASE ONE – APPLICATION AND ESTABLISHING THE CERTIFICATION BASIS

The objective of this phase is to provide technical information about the project to the team of experts to enable the definition and agreement on the initial type certification basis. Phase one covers activities up to and including the initial Type Board Meeting. The applicant will have already conducted a considerable amount of conceptual and design work. The certification approach and strategy will be determined during this phase. The primary output is an agreement on the initial basis of certification.

7.1 Pre-Application Inquiries/Meetings

The applicant seeking to go through a TC approval with the SACAA is encouraged to contact the SACAA in writing before submitting a TC application. Upon receipt of a type certification inquiry by the Manager of the Airworthiness Engineering Department (AED), the Manager of AED will allocate the Project Manager and project team members. The Project Manager

will communicate with the potential applicant for a pre-application meeting, in which the applicant will be familiarised with the type certification process and the SACAA obtains a preliminary assessment of the general features and degree of complexity of the proposed product design. The holding of exploratory discussions is useful in assessing the applicant's knowledge of certification procedures and to explain the SACAA's role and the applicant's responsibilities. The objective of the pre application inquiry meeting is to check the applicant's eligibility and to establish a team of experts.

7.2 Concept Briefing

A concept briefing is suggested for complex projects. During a concept briefing the applicant should be prepared to provide a detailed description of the product. The applicant is expected to advise SACAA how they intend to show compliance for novel or unusual features although at this time the applicant need do so only in a top-level fashion. The concept briefing is the first formal discussion of certification basis and means of compliance. Attendees at the briefing should include both SACAA specialists and managers.

7.3 The agenda may include the following general topics:

- 7.3.1 Aircraft, RPS, engine or propeller overview;
- 7.3.2 High level project overview
- 7.3.3 Organisational capabilities and resources
- 7.3.4 Design subcontractors and their envisaged services
- 7.3.5 Any applicable lessons learned from previous programs;
- 7.3.6 Novel and unusual features;
- 7.3.7 Applicable airworthiness standard proposed
- 7.3.8 Schedule for follow-on specialist meetings; and
- 7.3.9 Objectives prior to initial Type Board meeting.

7.4 Concept Briefing Minutes

Minutes taken during the concept meeting will be considered as important as any other documents submitted by the applicant. All issues discussed and addressed during concept briefing must be closed. Concept briefing minutes will be included in the project file.

7.5 Application

The applicant must submit an application form CA 21-02, accompanied by proof of payment to eng@caa.co.za for the application of issuance of a type certificate or amendment thereof in accordance with the requirements of Subpart 2 and Subpart 3 of Part 21 of the SACARs and the associated technical standards SACATS 21. The completed application form CA 21-02 needs to be accompanied by the appropriate fee as prescribed in Part 187 of the SACARs.

7.6 Fees

Part 187 of the SACARs defines the relevant fees for the product design type certificate and fees are charged to the applicant based on the hourly rate for the time spent on the project by SACAA personnel.

7.7 Establish Baseline Project Schedule

- 7.7.1 The applicant is required to include a proposed baseline project schedule, which is essentially top-level schedule that only identifies major milestones. The Project Manager is expected to work with the applicant towards the development of a more detailed project schedule.
- 7.7.2 Ideally, the applicant, who has the most control over the timing of events, writes this schedule and disseminates it to the certification team. The schedule should include the major milestones such as design review meetings, ground, flight and conformity tests, planning and completion dates, substantiation data submittal dates and submission and acceptance of major certification reports.
- 7.7.3 The Project Manager will endeavour to assure that any SACAA resource constraints are accommodated in the schedule. The schedule should cover milestones, accomplishments, and the expected levels of involvement of both the applicant and the SACAA project team.
- 7.7.4 The applicant is responsible for meeting the milestones in the project schedule and plan. Any slippage in the milestone dates may result in a delay in the final certification.

7.8 SACAA Team Members

- 7.8.1 The SACAA project team will consist of the Project Manager, aeronautical/mechanical engineers, avionics/electrical engineers, manufacturing inspectors, airworthiness inspectors and any other relevant departments as required.
- 7.8.2 The project manager sends an acknowledgment letter to the applicant identifying the project number, project manager's name and contact details.

7.9 Create Action Item Database

- 7.9.1 Action items may result from meeting minutes, flight test debrief notes, review of reports or a multitude of other sources. The Project Manager will work with the applicant project manager to create an action item database.
- 7.9.2 Primary responsibility for maintaining the action item database is the applicant project manager and the SACAA project manager verifies its accuracy. The database is a shared database with input from all members of the certification team, applicant and SACAA alike. It is the responsibility of whoever raises a new action item to advise the SACAA and applicant project managers of the item. Ideally, the applicant, who has the most control over the timing of events, controls the Action Item Database.
- 7.9.3 Such a database is simply a list of outstanding action items that need to be accomplished in order to reach the certification target. This could include signatures required on the Compliance Program, open action items, open issue papers, remaining tests, reports to be submitted and accepted, or any element of SACAA's LOI or the applicant's compliance demonstration and recording. The list diminishes over time as actions are completed.
- 7.9.4 The database will remain active to the end of the certification process in order to ensure that no action items are overlooked and that all items are dealt with before the project is completed. A LOI matrix, described in Phase Two, will complement the action item database.

7.10 Reports/ Meeting Minutes

- 7.10.1 Reports are generated as an output from formal meetings, ad hoc meetings, test witnessing and some telephone calls or e-mails. A report might be generated anytime throughout the certification process. The rule of thumb should

be that if a decision was made or an action item agreed, some form of report should be made. The essentials of the meeting should be captured, including identification of personnel involved, date, place, topic, decisions made, and action items generated.

7.10.2 In addition, the report should indicate the agreement of the participants to the accuracy of the decisions or action items identified in it. All team members shall ensure that the Project Manager and the applicant project manager are aware of new action items and decisions made. The project managers will ensure that the action item database is updated with the new items.

7.10.3 Either the applicant or a SACAA team member may write a report. In either case, copies must be forwarded to both the Project Manager and the applicant project manager. Ideally, both sides of the team will have reviewed it for accuracy. Signatures may be used to record agreement to the accuracy of the report.

7.10.4 Larger, pre-planned meetings should have a secretary named ahead of time who will be responsible for generating minutes / reports.

7.11 Identify Special Conditions and Equivalent Level of Safety

7.11.1 Special conditions as referred to in Regulation 21.02.12 may be applicable in situations whereby the proposed design change consists of systems, components or parts which have not been previously certified, new materials, features and or safety challenges which may not be sufficiently covered by any of the applicable certification and/or airworthiness standards for an aircraft, aircraft engine, or propeller.

7.11.2 In cases where special conditions exist, or when it is difficult to show compliance to a published standard, the applicant shall provide a detailed description of any such unusual design features and to demonstrate that the design meets an alternative and equivalent level of safety as agreed upon by the project certification team.

7.11.3 When the need for a finding of equivalent safety becomes apparent, the Project Manager shall ensure that discussions documenting the logic of the finding of equivalent safety are captured in a technical issue paper. Issue Papers (IP) provide a structured means to address certain issues in the type certification process. They also provide a structured means for describing and tracking the resolution of significant technical, regulatory and administrative issues that occur during a project. They are useful in addressing novel and controversial technical issues.

7.11.4 For type certification projects, IPs are useful tools for keeping an unbiased uniform certification approach between applicants. They also form a valuable reference for future type certification programmes and for development of regulatory changes. An IP is not required to document a particular Means of Compliance (MOC) that is consistent with existing directives, GMs, or other written SACAA policy.

7.12 Identify Required Exemptions

7.12.1 An applicant may apply to the Director for Civil Aviation (DCA) for an Exemption from a particular requirement.

7.12.2 An Exemption may be issued where it is the opinion of the DCA to be in the public interest and not likely to affect aviation safety. Part 11 of the SACARs is the applicable regulation governing exemption applications.

7.12.3 Exemptions granted to design standards are permanent and are recorded in the basis of certification.

7.13 Elect to Comply with Later Standards

When there is an amendment to the airworthiness standards, an applicant may elect to voluntarily apply and show compliance to later amendment standards than those agreed on for the project certification. Applicants may elect to voluntarily apply standards later than those agreed upon for the certification project. It must be understood that any additional standards with which the applicant elects to comply with will form an integral part of the certification basis for the given product and are not optional for subsequent changes to the type design. If the applicant and the SACAA agree to show compliance to the later amendment, then this agreement will be documented in the certification plan and the project's certification basis.

7.14 Established Certification Basis and Certification Plan

7.14.1 Establishment of Certification basis involves the determination of aeronautical design standards used when the product is certified. The envisaged design change should remain within the boundaries of the established product certification basis.

7.14.2 One of the first tasks in a Type Certificate project is defining a certification basis. The certification basis is the set of regulations, special conditions, equivalent safety findings, and exemptions to the rules that identify the airworthiness standards and other requirements to which the applicant must show compliance. The applicant must demonstrate compliance with all elements of the certification basis to the satisfaction of the SACAA before the TC may be issued.

7.14.3 The Certification Plan ensures that early agreement is reached between the applicant and SACAA on the detailed plan of compliance applicable to the type certification requirement for each specific system or technology area. The certification requirements include compliance with both Standards and Regulations.

7.14.4 A Certification Plan is developed by the applicant and exists as a sub-set within the General Compliance Program (GCP). Each Certification Plan should be written to address a specific system or technology area, some examples of which are landing gear system, landing gear loads, pitch trim system, flight loads, etc.

7.14.5 Preparation of Certification Plans is linked closely with the preparation of the GCP. The means of compliance to be indicated in the GCP is often fairly general in nature. The Certification Plan provides a formal vehicle to present and agree upon specific methods of compliance. For example, if 'test' is the means of compliance indicated in the GCP, the Certification Plan will indicate whether the test is a flight test, ground test, rig test, or component test, etc. Other information included, such as a proposal of the LOI by SACAA in terms of delegation and test witnessing, as well as the deliverables to SACAA, are identified in detail.

7.14.6 The need to develop a Certification Plan should be discussed with SACAA to ensure that there is value in the exercise for each specific case.

7.14.7 The applicant is expected to have at least drafted Certification Plans in Phase One of a Type Certification Program.

7.14.8 Once the product certification basis is identified and agreement reached between the applicant and the SACAA. The plan shall also include a compliance checklist or matrix.

7.14.9 The applicant and SACAA shall agree on the specific means of compliance to the airworthiness standards and regulations shown in the compliance matrix.

7.14.10 A typical plan shall consist of some of the following items:

- a. Introduction

- b. A brief system description
- c. Type of aircraft
- d. System safety assessment report
- e. Applicable requirements and airworthiness standards
- f. Reference to the certification basis as specified on the TCDS of the type certificated product
- g. A compliance checklist - A list of applicable airworthiness standards or specific certification basis such as SACARs and SACATS, FAR, etc. versus proposed MOC on an item-by-item basis
- h. List of all the activities pertaining to compliance demonstrations such as test witnessing, compliance tracking, compliance inspections and records, conformity statements
- i. Program time schedule for achieving compliance, milestones and action item assignments etc
- j. Required compliance documents, e.g., Flight test plan, PSAC, FHA etc.

7.14.11 Other information included, such as a proposal for the LOI by SACAA in terms of delegation and test witnessing, as well as the deliverables to SACAA such as documents required for showing of compliance to the applicable requirements and their scheduled date of availability shall be included in the Certification Plan for each compliance item.

7.15 Establish the Compliance Program

7.15.1 The compliance program specifies each item within the compliance matrix as a MOC by which the applicant is proposing to demonstrate compliance with the requirements. The applicant is requested to produce a Compliance Program for review and acceptance by SACAA. A requirement can be complied with for example by flight test, static test and/or substantiation report. Other notable MOC may be as follows:

- a. Calculation/Analysis: Report for the evaluation of loads, strength, performance, flying qualities and other characteristics.
- b. Safety Assessment: Safety analysis philosophy and methods, safety evaluation plans (e.g. software), system safety assessment, zonal safety assessment and others.
- c. Flight Test: Flight test reports.
- d. Inspections: conformity inspections to verify that materials, parts, processes and fabrication procedures conform to type design.

7.16 Function and Reliability Test Flight Requirements

7.16.1 If function and reliability test flying is required, it should be identified in the Certification Plan and tabled at the initial Type Board meeting. At the beginning of the certification project the applicant should present a function and reliability test flight specific Certification Plan or test plan. An issue paper or certification memo may also be raised on the topic in Phase Two detailing the extent of the function and reliability test flights to be done and how credit toward the requirement could be given using pre-production flight test vehicles.

- a. The Project Manager must ensure that an agreement is reached between the team and the applicant on:
 - i. The function and reliability test plan;
 - ii. The representative type design configuration to be subject to function and reliability test flying;
 - iii. Where applicable, the breakdown of dedicated and non-dedicated function and reliability test flight hours; and
 - iv. The extent of SACAA involvement.

- b. The applicant should submit for acceptance a separate schedule of test activities, including systems to be exercised, the frequency of exercising each system, test flight witnessing, etc.
- c. In Phase Four the last function and reliability flight tests are completed. Frequently this is done in conjunction with operational evaluation flights.

7.17 Initial Type Board Meeting (ITBM)

- 7.17.1 The type board shall consist of the project manager and representatives from management, senior personnel from appropriate engineering disciplines, flight test, manufacturing, airworthiness inspectorate and flight operations.
- 7.17.2 The goal of the ITBM is to bring together the applicant with the specialists and management from SACAA to exchange information about the technical aspects of the aeronautical product, its proposed certification basis and the proposed schedule. Attendance should be the SACAA certification team, their Managers, Aircraft Maintenance, Manufacturing, Flight Operations and the applicant counterparts at the engineering and management levels.
- 7.17.3 Applicants are urged to discuss their expectations for the certification process with their SACAA counterparts prior to the initial type of board meeting. At the initial type of board meeting, the applicant should be fully prepared, present information clearly, agree on milestones and identify any possible areas of contention.
- 7.17.4 A suggested agenda for an ITBM is:
 - a. Detailed Design Description. This will include the anticipated role of the aircraft, weights, performance, passenger capacity, etc. and include any novel or unusual features to be incorporated into the design.
 - b. Identification of the product Basis of certification. The ITBM meeting will formally agree to the certification basis while acknowledging that there may still arise unknown Special conditions, findings of equivalent safety, Exemptions and Election to Comply items that it will be necessary to include in the basis of certification.
 - c. Proposed Certification Schedule. This will identify the top-level. At this time any SACAA resource constraints will be discussed. In addition, any lower-level schedules that are already completed at this time may be discussed. These might include Rig Testing, Flight Testing.
 - d. Flight Test Program overview
 - e. Maintenance Schedule proposed.
 - f. Function and Reliability Test Flights program
 - g. SACAA LOI Overview
 - h. Operational Evaluation plans
 - i. Plan for development of Instructions for Continued Airworthiness (ICA) and Maintenance Review Board (MRB)
 - j. Involvement of suppliers and partners
 - k. Engine and propeller certification status
- 7.17.5 The primary outputs of the ITBM are an agreed Certification Basis and a commitment to respect the schedule. These outputs are documented in the minutes of the meeting. The minutes of the meeting should be made available to attendees shortly after the meeting.

8. PHASE TWO: ESTABLISH MEANS OF COMPLIANCE AND SACAA LOI

- 8.1 The objective of this phase is the definition of and the agreement on the proposed means of compliance for each requirement of the certification basis and the identification of the CAA certification team's level of involvement.

8.2 By the end of this phase a thoroughly planned certification approach with considerable detail should be available that has been negotiated and agreed with SACAA. Although testing and demonstrating compliance is part of Phase Three, Phase Two may include cockpit mock-ups and other tools to agree on the certification nuances of proposed configurations.

8.3 Provide Fundamental Certification Documents

8.3.1 Certain compliance documents are required very early in the certification program as aids to discussion and to improve the certification teams' understanding of the applicant's product. These early deliverables are called the Fundamental Certification Documents (FCD). The FCDs should be drafted by the applicant during Phase One and submitted for discussion and acceptance by SACAA early in Phase Two. The list includes, but is not limited to:

- a. Aircraft level safety assessment
- b. Certification plan
- c. Compliance checklist (CCL)
- d. Project Description
- e. Baseline Certification Project Schedule
- f. Durability and Damage Tolerance Methodology and vii. Plan for software aspects of certification (PSAC) for systems that contain software

8.4 Compliance Checklist

The CCL is a key document in type-certification; it allows tracing back to the compliance document and is essential in the post-TC phase for approval of changes. An applicant must produce the Compliance Checklist to show a record of compliance with every applicable certification requirement. This CCL must refer to the documents necessary to demonstrate compliance with applicable requirements, based on the mentioned MOCs. It must be sufficient to provide comprehensive information of how compliance will be demonstrated, contain all references to enable to single out the compliance demonstrations that have been carried out (identification of the relevant report, its title and edition, page number, reference to other documents etc).

8.5 Refine Certification Plan and Project Schedule

8.5.1 The Certification Plan is developed by the applicant in Phase One. In Phase Two, SACAA and the applicant should discuss, negotiate and modify the certification plan as necessary prior to acceptance of by SACAA. Acceptance of the Certification Plan accomplishes the core goal of Phase Two, which is to agree on the means and methods of compliance and LOI. The witnessing requirements and compliance inspection requirements should be identified in the discussions and should be documented in the plans as appropriate.

8.5.2 In Phase Two, the overall development schedule produced by the applicant for the ITBM should be expanded into a detailed schedule. The exact testing requirements should be developed mainly from the certification plan. The detailed schedule should be compared to the LOI matrix to provide early identification of busy periods and timing conflicts for SACAA. This schedule should be regularly updated and shared with SACAA.

8.6 Establish Maintenance Review Board

8.6.1 For large transport category airplanes, maintenance programs and supporting instructions are typically developed using an MRB. The Aircraft Maintenance and Manufacturing Departments certification team member, in cooperation with his applicant counterpart, will initiate and follow through with this activity.

8.7 For rotorcraft, small airplanes and engines, the MRB process has seldom been applied, but a plan to address the requirements for Instructions for Continued Airworthiness (ICAs) is needed within Phase Two.

8.8 Define Conformity Inspection Requirements

At this phase SACAA should identify all the conformity inspections required. The list should consider the rigour of conformity used by the applicant, the adequacy of the applicant's configuration control system, as well as the criticality of the configuration for the relevant tests. The Project Manager should extract all conformity requirements from certification plans. A certification team meeting might be needed to accomplish this planning. Details of the conformity requests will follow in Phase Three.

8.9 Create LOI Matrix

8.9.1 The LOI should be depicted in a "matrix format" created by either the applicant or the SACAA Project Manager. Each activity, such as conducting a test, completing a report or assembling data is listed. The levels of involvement for SACAA for each document, data element or test can then be shown next to the activity.

8.9.2 The matrix should include references to the certification schedule and to any known SACAA resource constraints that could affect the schedule. It should be possible to identify the responsibilities in the matrix at the level of the individual responsible for the activity. The level of detail that can be presented for each requirement using a LOI matrix ensures that SACAA and the applicant understand their respective expectations and obligations. The specialists and managers, both at SACAA and with the applicant, must agree to the LOI.

8.9.3 The SACAA LOI can be considered as the total of all:

- a. Reports to be reviewed and accepted
- b. Flight Manual and Airworthiness Limitation approvals
- c. Reports received for information
- d. Test witnessing
- e. Conformity inspections conducted by SACAA
- f. Engineering inspections conducted by SACAA
- g. Flight testing activities conducted by SACAA
- h. Activities associated with issue papers
- i. Software process reviews on site, including those for programmable logic devices
- j. Meetings including design review and type boards
- k. SACAA findings of compliance

8.10 Issue Certification Memorandums

8.10.1 A Certification Memorandum is raised when a point of clarification is required with respect to a requirement or group of requirements within the certification basis.

8.10.2 During type board meetings, the Project Manager shall provide a status report of the outstanding Certification Memorandums.

8.10.3 An example of a Certification Memorandum can be found in Appendix A of this TGM for Type Certification.

8.11 Establish Configuration Control System

- 8.11.1 The applicant is always expected to have an effective configuration tracking system in place.
- 8.11.2 Before each certification test such as, for example, flight, ground, fault board analyses, etc., the applicant must document the configuration of the product and must ensure that the product is representative of the type design in those areas that will be the subject of the test.
- 8.11.3 If the type design is changed after a certification test, the applicant may have to either repeat the test or substantiate that the design change does not affect compliance with the relevant design standard requirements.
- 8.11.4 SACAA may conduct conformity inspections as necessary. At the end of the certification project, the configuration control system must result in a definition of the type certified product.

8.12 Cockpit Review Meetings

The design of the cockpit involves many subjective assessments of ergonomics and is typically of interest to all certifying authorities. Frequently it is useful to define the cockpit layout well in advance of other aspects of the design. Meetings are usually held to discuss these matters, often with the aid of a cockpit mock-up.

8.13 Review and Accept Documents

- 8.13.1 During Phase Two the first of the compliance documentation may be generated and submitted to SACAA, although the bulk of the documentation is generated in Phase Three. The reports submitted during Phase Two will usually be test plans, certification plans or fundamental certification documents.
- 8.13.2 Reports submitted for review as part of SACAA LOI, are sent to the Project Manager, logged in and forwarded to applicable team specialists. Comments from the specialists are received by the Project Manager, consolidated into an official correspondence, and forwarded to the applicant. Once the applicant has shown compliance to appropriate requirements, the SACAA specialists may sign-off the Compliance Program.
- 8.13.3 The applicant and SACAA responsibilities are as follows:
- a. The applicant is encouraged to discuss report content with the SACAA specialist prior to submitting the report to SACAA.
 - b. The applicant is responsible for submitting to SACAA the certification deliverables identified in the Certification Plans.
 - c. The Project Manager shall monitor the submission schedules. Should serious delays occur, he will advise the certification team and management.
 - d. The Project Manager shall also ensure that copies of all other documents referred to in the compliance plan are available to the team.
 - e. The certification team shall review the submissions in a timely manner and provide concise technical comments or acceptance of the documents.
 - f. The Project Manager shall facilitate discussions between specialists as needed and collate all technical comments in a letter to the applicant. Once acceptance on a report is reached, the applicant or Project Manager should note acceptance on the LOI matrix.

9. PHASE THREE: DEMONSTRATE COMPLIANCE

The objective of this phase is the demonstration of compliance with the applicable certification basis and the acceptance of compliance demonstrations. Having established and agreed on the means of compliance (MOC), the applicant must provide the SACAA with tests and calculations demonstrating compliance with the certification basis, normally by means of documents and reports.

Phase Three will culminate in a declaration by the applicant that the design complies with the requirements.

9.1 Design Review Meetings

9.1.1 Design review meetings are generally intended to allow SACAA specialists to perform detailed reviews of specific areas of the product design with their counterparts. Design Review meetings should be scheduled well in advance, but they may be arranged as required. Typically, project management is not represented at these meetings. The objectives of the meetings are to gain detailed knowledge of the product design in specific areas and enable SACAA to accept the company proposals on finding compliance. The applicant is responsible and expected to prepare meeting minutes and have SACAA sign-off on such minutes.

9.1.2 The Specialist attending a design review meeting must ensure that:

- a. A detailed report is prepared outlining the specific topics discussed and the aspects of the product reviewed.
- b. The report identifies agreements reached and records any outstanding action items.
- c. A copy of the report is given to the Project Manager for updating of the overall project status, the action item database, the LOI Matrix and the compliance plan, and to aid in preparation of type board and management meetings.

9.2 Update Project Schedule

9.2.1 The applicant is responsible for updating the overall project schedule. Updates to the project schedule are likely to affect the LOI matrix and the LOI schedule. Regular communication between the applicant and the Project Manager is needed to avoid conflict with other SACAA commitments and constraints.

9.2.2 The Project Manager may have team meetings or another method to ensure that specialists are aware of significant changes in schedule.

9.3 Prepare Test Plans

9.3.1 At the beginning of a project, or soon after the start, an agreement must be reached between the team and the applicant on the required tests and the responsibility for test witnessing. The details must be written into the Certification Plans and LOI Matrix. Test Plans will be written by the applicant and accepted by SACAA. They identify the test apparatus, test vehicle and configuration, test details including conditions and pass/fail criteria, data requirements, and hazard level with risk mitigation actions. Test Plans should be written and accepted as early as possible and prior to the test.

9.3.2 Time for SACAA review must be provided. Applicants should be cautioned that if the test plan is not accepted or if SACAA's test witnessing requirements are not satisfied before a test is conducted, there is a risk that SACAA will not accept the test results.

9.3.3 Test articles will be built to an agreed build standard and shown by the applicant to conform to that standard. In many cases the SACAA specialist will request that an additional conformity inspection be performed before the test is conducted. The Manufacturing inspectors will conduct this conformance inspection.

9.4 Witness Tests

- 9.4.1 Specialists witness tests to be able to assess the design and to make a finding of compliance. Authorised Persons are expected to witness all tests, as per SACAA LOI.
- 9.4.2 SACAA specialists witnessing tests do not participate in the tests. This ensures that the individual remains impartial and can concentrate on the overall activity rather than being tasked with performing a specific function while the test is going on.

9.5 Engineering Inspections

- 9.5.1 An engineering inspection is a specific task carried out to review the finished product against the design requirements. An engineering inspection is not a conformity inspection.
- 9.5.2 Reasons for an engineering inspection include:
- a. To give perspective to the drawings and determine their adequacy.
 - b. To provide familiarization with the aircraft: its layout, systems operations and structural load paths.
 - c. To show possible interactions and interference between systems or components.
 - d. To examine HIRF or lightning related features such as bonding or gaps in metallic enclosures.
 - e. To conduct zonal inspections for the purposes of compliance to standards for flammable fluids, fire zones or interior installations.
 - f. To verify compliance with the requirements of an airworthiness standard.
- 9.5.3 SACAA specialists conducting an engineering inspection should document the results and note any discrepancies resulting from design or conformity issues as action items for the applicant. The applicant must be debriefed on the inspection and the action items recorded.

9.6 Issue Flight Permits

- 9.6.1 An Experimental C of A is required for all developmental and certification flight-testing issued in accordance with Subpart 21.08.4 and 21.08.5 of Part 21 of the SACARs. This flight authority is not an airworthiness declaration but simply permission to fly an aircraft deemed safe for flight. Such a flight permit will have conditions and restrictions attached which will change throughout the certification program.
- 9.6.2 After each certification flight test, the SACAA keeps record of De-brief Notes. They document the flight test results with comments and identify certification issues and/or ask questions which the applicant must action. The applicant must track the flight test debrief notes and keep SACAA project manager apprised of the status of the action items. The SACAA project manager shall always be kept informed as to flight test debrief notes related to the project.

9.7 Perform Company First Flight

- 9.7.1 The application for first flight requires meeting pre-requisites: for example, the existence of a maintenance program, achievement of an appropriate level of maturity of the design, establishment of a conformity control system and completed pilot egress training. The Project Manager shall coordinate the engineering, maintenance and flight test acceptance of the conditions and limitations for the flight authority.
- 9.7.2 A draft Aircraft Flight Manual is required as early as possible, typically two months before the company first flight. This draft will mature and grow during the certification project.

9.8 Intermediate Type Board Meetings

- 9.8.1 The Intermediate Type Board is normally held prior to first flight with SACAA personnel. This meeting is optional but encouraged. More than one intermediate type board meeting could be convened. The meeting serves as a useful management update between senior management representatives from SACAA and the applicant's organization. The meeting should be used to:
- a. Review the design description;
 - b. Review the basis of certification;
 - c. Review the status of the certification tests;
 - d. Review the status of the compliance plan;
 - e. Review the status of issue papers and Certification Memos;
 - f. Review / sign-off Conditions for SACAA First Flight personnel;
 - g. Provide an overview of the project status and schedules;
 - h. Provide the status of reports submission and acceptance/approval;
 - i. Identify significant issues and problems; and
 - j. Establish a mutually agreed direction and action to resolve areas of concern.

9.9 SACAA First Flight

In essence, the requirements outlined here are an extension of the company's first flight activities but with more stringent assurance that the aircraft is "safe for flight". The Project Manager will coordinate this approval.

9.10 Flight Test Debrief Notes

Flight Test De-Brief Notes are written by the SACAA Flight Test Team after each certification flight. They document the flight results with comments and identify certification issues and/or ask questions which the applicant must action. The applicant must track the flight test debrief notes and keep SACAA management informed of the status of the action items. The SACAA project manager shall always be kept informed as to flight test debrief notes related to the project.

9.11 Create Action Item

- 9.11.1 Towards the end of Phase Three the need to track work remaining becomes increasingly important. Accordingly, some form of "to-do" list is often created. A previously created action item tracking system can serve this function.
- 9.11.2 Such a list is simply a list of outstanding action items that need to be accomplished in order to reach the certification target. This could include signatures required on the GCP, open action items, open issue papers, remaining tests, reports to be submitted and accepted, or any element of SACAA's LOI or the applicant's compliance demonstration and recording. The list diminishes over time as actions are completed.
- 9.11.3 The Project Manager and the applicant should work together on this list that provides management with the required summary of future activities while also providing the certification team with the required task details and proposed schedules to meet the goals. It is expected that if a complete and current LOI Matrix, LOI schedule and Action Item tracking system have been created and updated; the creation of an accurate "to-do" list should not involve significant effort.

9.12 Finalize Definition of Type Design

SACAA specialists require a thorough understanding of the configuration for which they are expected to find compliance. The Project Manager needs this information for dissemination to the certification team. The information forms an integral part of the TCDS. It is the applicant's responsibility to clearly define the product or type design being certified. Reference to a model number or name is not sufficient. Typically, reference to a definition drawing, a top drawing or a detailed configuration description is used to define the product being approved. Some applicants will further define the product as a basic aircraft with a list of optional equipment.

9.13 Applicant/SACAA Certification Readiness Review Meeting

9.13.1 Near the end of Phase Three it is useful to hold one or more certification readiness review meetings. In such a meeting, specialists and applicant discuss the entire design with the goal of determining how close the project is to the goal of certification. Topics will include open action items, unfinished tests, determination of the flight envelope to be approved, closure of issue papers, approval of airworthiness limitations and of the flight manual, and any other items from the "to-do" list.

9.13.2 There might be three certification readiness review meetings: one held by the applicant alone, one held by the SACAA team alone and a combined certification team meeting. The purpose of the separate meetings is to prepare for the combined meeting.

9.13.3 The end of Phase Three will be a declaration that the design is compliant with its certification basis and that no unsafe feature is known to exist. Both are equally important. It is the goal of the certification readiness review to discuss and agree on actions needed to make this declaration.

9.14 Finding of Compliance and Compliance Matrix Sign off

9.14.1 Sign-off of compliance matrix by SACAA is done in both Phase Three and Phase Four. The Compliance Matrix sign-off process is a systematic means to record compliance with all the applicable airworthiness requirements. It provides confidence that the approval of the Supplemental Type Certificate is warranted.

9.14.2 The typical sign-off includes each applicable paragraph of the certification basis signed by each applicable specialty area within the applicant's design approval organization. It is countersigned by SACAA specialists in areas where SACAA has expressed a need for involvement.

9.14.3 The original paper copy of the Compliance Matrix is signed by the applicant near the end of Phase Three. Ideally, signatures should be applied at the earliest opportunity once compliance has been shown for an item.

9.14.4 There are essentially four situations that may exist at the end of Phase Three with respect to findings of compliance:

- a. Applicant and SACAA agree compliance have been demonstrated. The applicant indicates their finding or recommendation of compliance by signing the Compliance Matrix against the specific requirement. The SACAA specialist indicates his concurrence that compliance has been shown by also signing the Compliance Matrix against the requirement.
- b. Compliance with limitations and/or mandated inspections: In some instances, compliance can only be found by the imposition of a limitation and/or inspection. If a limitation/inspection can enable compliance to be found, the applicant and the SACAA specialist shall sign the Compliance Matrix. SACAA must provide explicit agreement on the acceptability of the limitations before the applicant can sign. The Compliance Matrix should be annotated to include the nature and location of the limitation/inspection that enabled the finding to be made. Such limitations/inspections must also be included as part of the appropriate approved publication: Flight Manual, Airworthiness Limitations Section of the Supplemental ICA, etc. Compliance items falling into this category are fully compliant, and as such could remain as permanent situations.

- c. A non-compliance exists: Sometimes the SACAA cannot make a finding of compliance because compliance has either not been fully established or the design change has been found not to be compliant with the product certification basis. The SACAA is therefore not able to sign the Compliance Matrix. Requirements that cannot be signed shall be listed as such and clear and agreed reasons shall be defined for each. Compliance finding items falling into this category may require interim limitations or mandatory inspections to be imposed to assure that these are satisfied.
- d. Applicant and the specialists are known to disagree: In cases where disagreement exists between the applicant and the specialist concerning compliance or means and methods of compliance, the Compliance Program shall not be signed. Such a disagreement would normally result in the creation of an issue paper as a vehicle to resolve the problem.

9.15 Review and Approve Aircraft Flight Manual

- 9.15.1 An approved Aircraft Flight Manual may be a requirement to ensure compliance to the certification basis of the aircraft.
- 9.15.2 SACAA Flight Test and Engineering specialists review the AFM and provide their comments to the Project Manager for formal transmission to the applicant, until there is an agreed version ready for approval.
- 9.15.3 It should be noted that only sections that are required to be approved by the airworthiness design standard, are to be approved by the SACAA Airworthiness Engineering section. These sections are usually the “Limitations”, “Procedures” and “Performance” sections of the AFM. General information, and information not specifically required to be furnished as per the design standard requirements, are not SACAA-approved. The Project Manager must establish the requirements from the design standard and approve those sections required to be furnished.
- 9.15.4 The final AFM must clearly identify and distinguish which sections are SACAA-approved.
- 9.15.5 Once the AFMS is completed, the applicant submits the document to the project manager. The SACAA Flight Test and Engineering specialists shall review the document and submit to Project manager for approval. The cover page must also contain a signature block for the SACAA.

9.16 Review and Accept MMEL and CDL

An approved Master Minimum Equipment List (MMEL) and Configuration Deviation List (CDL) is not a requirement for the issuance of a Type Certificate. However, if an applicant wishes to have a MMEL and CDL, it will normally be developed during Phase Three of the type certification project. The applicant will forward a draft MMEL and CDL to the responsible person in the SACAA for review and acceptance. A formal review meeting of applicant and SACAA specialists will be convened and may include operators, Commercial and Business Aviation and foreign authorities.

9.17 Review and Approve ICA

- 9.17.1 At the start of the project, all parties will discuss and agree on the extent of the Instructions for Continued Airworthiness (ICA) that will be needed to ensure proper operation and maintenance of the product in the field. The title, format and content of these instructions should be defined as early as possible. The detailed content may be revised during the certification project as the need arises and as agreed to by the team and the applicant.
- 9.17.2 ICA are required to show compliance with a particular paragraph of the airworthiness standard applicable to the product.

9.17.3 The airworthiness limitations section must contain any mandatory replacement times and mandatory structural inspection intervals and procedures required for compliance with Damage-tolerance and Fatigue Evaluation of Structure of the airworthiness standard applicable to the product. These are called Certification Maintenance Requirements (CMR).

9.17.4 The applicant may use an MRB process, a Maintenance Type Board (MTB) process or a Manufacturer's Recommendation process to develop its maintenance program.

9.17.5 The Project Manager will:

- a. ensure the early involvement of the Aircraft Maintenance and Manufacturing sections in the discussions with the applicant.
- b. ensure that the Certification Plan identifies items that are to be submitted by the applicant to address the instructions for continued airworthiness.
- c. coordinate the review of the Airworthiness Limitations with the team and their subsequent approval.

9.17.6 The final ICA must clearly identify and distinguish which sections are SACAA-approved.

9.18 Develop the Type Certificate Data Sheet

9.18.1 Work on this activity spans Phases Three and Four. The TCDS forms part of the Type Certificate.

9.18.2 The TCDS:

- a. Defines the type design, often by reference to a top-level drawing.
- b. Identifies the applicable regulations that form the certification basis.
- c. Identifies the limitations and conditions under which the type certificate was issued, which might include description of the approved flight envelope, engine limits, approved fuels and lubricants, maximum weights, number of passengers, the Airworthiness Limitations, the approved MRS report (if applicable) and the applicable ICA by reference to the maintenance manual or section where this is recorded.

9.18.3 The Applicant and Project Manager Responsibilities:

- a. The applicant is to provide the necessary content for the draft TCDS. Often the applicant will provide a completed draft TCDS.
- b. The Project Manager will create the SACAA draft TCDS. The TCDS must be compiled with care, as it becomes a public document used widely by the aviation community worldwide for subsequent approvals. The Project Manager will forward the draft TCDS for comment to the applicant and all certification team members.
- c. The applicant and the team member specialists ensure that the information is accurate and complete prior to certification.
- d. The Project Manager will arrange for the final release of the TCDS concurrent with the Type Certificate.

10. PHASE FOUR –TYPE DESIGN APPROVAL

The bulk of the compliance demonstrations and findings were made in Phase Three. Phase Four objectively focuses on technical closure of the type certification investigation and issuing of the certificate.

10.1 Close Issue Papers and Action Item List

10.1.1 Issue papers and Action items should be closed as soon as practical. Often, they will be closed in Phase Three. Closure should be based on an agreed position and not necessarily on the demonstration of compliance. For

example, should the issue concern a means of compliance, it should be closed as soon as SACAA and the applicant have agreed on the appropriate means of compliance.

10.1.2 It is expected that all action items and issue papers would be closed before certification.

10.2 Sign-off Compliance Matrix

As per the project compliance program, the sign-off on the Compliance Matrix by the applicant and by SACAA is done in both Phase Three and Phase Four. At the end of Phase Three the original Compliance Matrix will be sent to SACAA for completion. At this point the applicant will have signed the Compliance Matrix completely, indicating either a finding of compliance or recommendation of such a finding. The Project Manager will have custody of the original Compliance Matrix. The Project Manager ensures that designated specialists have access to provide compliance finding signatures.

10.3 Approve MRB Report

The MRB Chairperson approves the MRB report. Continuing Airworthiness may provide advisory assistance on the MRB as required.

10.4 Review and Approve Airworthiness Limitations Section

The changes to the Airworthiness Limitations section of the ICA must be approved by the Airworthiness Engineering Section. The applicant will have provided suggested changes to the Airworthiness Limitations at the end of Phase Three. The Project Manager will distribute this for acceptance by the affected engineering specialists. Once all affected specialists have accepted the contents, the Airworthiness Limitations section changes are approved. The original is forwarded to the applicant for publishing and safekeeping.

10.5 Approve Flight Manual

The applicant will have provided a proposed Flight Manual at the end of Phase Three. The Project Manager will distribute this for comment by the affected engineering and flight test specialists. The Project Manager will coordinate the discussions and criticisms to establish a basis for consensus. Once all affected specialists have accepted the contents, the appropriate sections of the Aircraft Flight Manual are approved in accordance with the design standard. The original is forwarded to the applicant for publishing and safekeeping.

10.6 Final Type Board Meeting

10.6.1 When the applicant has met nearly all certification requirements, a final type board meeting is held. The board reviews any outstanding items and decides on the recommendation to issue the Type Certificate.

10.6.2 The objectives of the meeting are to review and evaluate the following:

- a. Closure of outstanding issue items
- b. Status of the compliance schedule
- c. Status of amendments to the Flight Manual
- d. Status of the Maintenance Manual and other Instructions for Continued Airworthiness

10.6.3 The outcome of the Final Type Board Meeting is:

- a. a list and schedule for all actions required to be completed prior to certification
- b. a list and schedule to resolve all issues required for foreign approvals

10.7 Issuance of Type Certificate

Once all the Type Certification requirements have been satisfied and the draft TCDS has been reviewed by the specialists, all assigned specialists make a recommendation for issuance of a Type Certificate to the Project manager. This recommendation should affirm that the design is compliant that it has no unsafe features, and that the SACAA LOI is complete.

10.8 Produce, Sign and Distribute

10.8.1 The applicant and/or the Project Manager will have provided a draft TCDS at the end of Phase Three. SACAA must create the official TCDS to be awarded to the applicant along with the Type Certificate. It is the responsibility of the SACAA Project Manager to create these documents and have them signed at the appropriate time.

10.8.2 Once signed, the original certificate and TCDS is forwarded to the Type Certificate Holder for safekeeping.

10.9 Requirements for First Certificate of Airworthiness (C of A)

Instructions for Continued Airworthiness containing the minimum information as required by the applicable Airworthiness Standard should be written and accepted by the date of issuance of the first Standard/Restricted Certificate of Airworthiness, or entry into service, whichever occurs later.

10.10 Provide Documents Required for Entry into Service

10.10.1 For many products the entry into service and the issuance of the first C of A occur for practical purposes on the same date. However, for some large transport airplanes, a distinction between these dates is useful. For example, when the first aircraft are delivered to a completion centre, they will be given a C of A although possibly lacking a completed interior or a complete suite of avionics. While the aircraft would have a C of A, the entry into service date would come later when the completion centre delivers the aircraft to the operator.

10.10.2 In some cases, compliance to some items, for example, to a few occupant safety requirements might not be determined until close to the entry into service date. In this example, the Compliance Matrix might remain unsigned for those affected paragraphs and the TCDS and/or Flight Manual would be annotated that no passengers are permitted. Accordingly, the entry into service date can become an important milestone in the approval process.

10.10.3 A Master Minimum Equipment List (MMEL) is not required by the certification requirements. Operational rules for some operators require the use of a Minimum Equipment List (MEL), which will drive the need to produce a MMEL. Thus, the entry into service date is often a useful deadline for the publishing of a MMEL if one is needed.

11. PHASE FIVE – POST CERTIFICATION ACTIVITIES

11.1 Retention of design data

11.1.1 The data constituting the design are contained in records, reports, drawings, and other documents that describe collectively the exact configuration of the design when it was approved. The TC holder must ensure that the design change records are permanent and may not be destroyed and must be made available to the SACAA for such routine activities as production inspection, surveillance, design reviews, development of corrective actions, or for any other reasons deemed necessary by the SACAA. The record-keeping should consist of at least the following:

- a. The drawings and specifications, and a listing of those drawings and specifications necessary to define the configuration and design features as it was shown to comply with the requirements applicable to the aeronautical product.
- b. Reports on analysis and tests undertaken to substantiate compliance with the applicable requirements.
- c. Information, materials and processes used in the construction of the aircraft, engine or propeller.
- d. An approved aircraft flight manual or its equivalent (type-related document), including revisions to the master minimum equipment list and configuration deviation list, if applicable.
- e. Approved revisions or recommendations to the maintenance programme or equivalent document, and aircraft maintenance manual with details of revisions to the manufacturer's recommended and SACAA accepted scheduled maintenance plan and procedures guidelines.
- f. Any other data necessary to allow, by comparison, the determination of airworthiness and noise characteristics (where applicable) of aeronautical products of the same type.

11.2 Transferability

Transfer of a type-certificate may only be made to a natural or legal person that is able to undertake the obligations as a holder of a type certificate, and, for this purpose, has demonstrated its ability to qualify under the criteria to become a type certificate holder. The Director shall be notified in writing of the name and addresses of the transferee and the subsequent selected design organisation. The type certificate shall be amended by the Director to reflect the new holders.

11.3 Period of validity



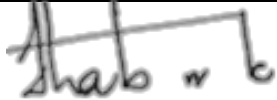

A type certificate is valid for an unlimited period until it is surrendered by the holder or is suspended by the authorised officer or cancelled by the Director. It shall remain valid subject to the holder being in compliance with the requirements of Part 21 for type certificate, or amendment thereof. If the type certificate is cancelled or revoked by the Director, the original copy must be surrendered to the Director of the SACAA.

11.4 Type Certificate Holder Responsibilities

- 11.4.1 The TC holder must supply instructions for continuing airworthiness to registered operators of aircraft or product purchased.
- 11.4.2 The TC holder will instruct each purchaser of their product to report to the TC holder of any failure, malfunction or defect that may affect the continuing airworthiness and compliance to environmental protection requirements of the aircraft. Also inform the TC holder when their contacts and addresses change.
- 11.4.3 The TC holder must also report to SACAA any failure, malfunction or defect that may affect the continuing airworthiness of the aircraft in accordance with the provisions of Part 21 Subpart 1 of the regulations. SACAA uses this information to determine if an unsafe or potentially unsafe condition exist in an aircraft.
- 11.4.4 The TC holder remains responsible for the continued integrity of the type design, or changes thereto, and must continue to be SACAA's contact point for resolving issues if corrective action is required. To fulfil this responsibility, the holder should have the capability, or has demonstrated their ability, to provide on-going technical support for service difficulties and when SACAA requires mandatory corrective action.
- 11.4.5 The TC holder must provide at least one set of instructions for safe operation and continued airworthiness, prepared in accordance with the appropriate airworthiness design standards to each purchaser of the product upon its delivery or upon the issuance of a standard certificate of airworthiness for the product concerned.
- 11.4.6 If a TC is transferred to another person by written agreement, the new TC holder assumes the responsibilities of the TC holder, as described in this subsection. This transfer may only be made to a person that is able to undertake the obligations and duties and has demonstrated their capability to qualify in accordance with Part 21 Subpart 2 for Type Certificates.

- 11.4.7 The holder of a type certificate shall keep the original type certificate and all relevant design information, drawings, and test reports, including inspection reports for the product tested. The TC holder shall keep the type certificate of the product in a safe place and produce such certificate to an authorized officer, inspector, or authorized person for inspection if so, requested by such inspector.
- 11.4.8 Upon surrender or revocation, the type certificate shall be returned to the SACAA.
- 11.4.9 The TC holder must provide to the SACAA for the purpose of tracking, information relating to any of their product that is sold and intended to be registered in the foreign state.

12. DOCUMENT AUTHORISATION

DEVELOPED BY:		
	PUSELETSO MASEKO	03 April 2024
CERTIFICATION ENGINEER	NAME IN BLOCK LETTERS	DATE
REVIEWED BY:		
	THANDI MOFOKENG	03 April 2024
SIGNATURE OF M: AED (ACTING)	NAME IN BLOCK LETTERS	DATE
VALIDATED BY:		
	LOBANG THABANTSO	04 April, 2024
SIGNATURE OF SM: AIR (ACTING)	NAME IN BLOCK LETTERS	DATE
APPROVED BY:		
	ERIC MATABA	04-04-2024
SIGNATURE OF E: ASO (ACTING)	NAME IN BLOCK LETTERS	DATE