

TECHNICAL GUIDANCE MATERIAL AIRCRAFT FLIGHT MANUALS

SUBJECT: TECHNICAL GUIDANCE MATERIAL FOR APPROVAL OF AN AIRCRAFT FLIGHT MANUAL

EFFECTIVE DATE: 9 September 2021

APPLICABILITY

This TGM is applicable to Approved Design Organisations and holders of modification design approvals for aircraft, aircraft engines and propellers.

PURPOSE

The purpose of this TGM is to provide information on Aircraft Flight Manuals (AFM), including approval of AFMs, changes to AFMs and AFM supplements.

REQUIREMENTS

1. REFERENCE

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

- i. Part 21 of the South African Civil Aviation Regulations (CARs), Certification Procedures for Products and Parts
- ii. SA-CATS-21 of the South African Civil Aviation Technical Standards, Airworthiness Requirements

2. TERMS AND ABBREVIATIONS

TERM	DEFINITION
Aircraft	means an aircraft as defined in the CARs, including its engines, propellers, rotor, components, parts, equipment, instruments, accessories and materials
Aircraft Flight Manual	means a manual that is part of the certification basis of the aircraft, containing the operating limitations within which the aircraft is considered airworthy, and any other information required for the safe operation of the aircraft, including all amendments and supplements for that manual.
Aircraft Type	means all aircraft of the same basic design, including all modifications thereto, except those modifications which result in a change in handling or flight characteristics

Airworthiness Data	means any information necessary to ensure that an aircraft or aircraft component can be maintained in an airworthy condition.
Airworthiness Standards	The design standards applicable to the Class I product for approval or certification under Part 21.
Approved Design Organisation	A design organisation approved under CAR Part 147 to carry out design activities under Part 21. An ADO's scope of approval may include approval and certification activities for modification/repair designs under Part 21 and approval of changes to flight manuals.
Authority	means the National Airworthiness Authority of the certifying country or State of Design
Class I Product	means a complete aircraft, aircraft engine or propeller, that has been type certificated in accordance with the appropriate airworthiness requirements and for which the necessary type certificate or equivalent have been issued
Type Certificate Holder	means the legal entity to which the type certificate is issued
Type Acceptance Certificate	means acceptance of a design approval for Class I product issued in terms of the CARs

ABBREVIATION	DESCRIPTION
AD	Airworthiness Directive
AED	Airworthiness Engineering Department
AFM	Aircraft Flight Manual
CAR	Civil Aviation Regulations
E: AE	Engineer: Airworthiness Engineering
E: ASO	Executive: Aviation Safety Operations
ICAO	International Civil Aviation Organisation
M: AE	Manager: Airworthiness Engineering
NAA	National Airworthiness Authority
SACAR	South African Civil Aircraft Register
SA-CATS	South African Civil Aviation Technical Standards
TAC	Type Acceptance Certificate

TC	Type Certificate
TCDS	Type Certificate Data Sheet

3. BACKGROUND

3.1. Regulatory Requirements

3.1.1. The International Civil Aviation Organization (ICAO) Annex 8 requires that each aircraft be provided with a flight manual, placards or other document stating the approved limitations within which the aircraft is considered airworthy as defined by the appropriate airworthiness standards, additional instructions and information necessary for the safe operation of the aircraft.

3.1.2. The CARs define an aircraft's flight manual (AFM) as a manual, associated with the certificate of airworthiness, containing limitations within which the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft.

3.2. General

3.2.1. An AFM is part of the type design as required by the type certification basis that the aircraft was originally certified to. In some cases the original certification requirements are changed by a Supplemental Type Certificate (STC), mandating the provision of an AFM even though the original type certification basis did not require the provision of an AFM.

3.2.2. An AFM is a manual provided for an aircraft which states the approved limitations within which the aircraft is considered airworthy, as defined by the appropriate airworthiness requirements, including additional instructions and information necessary for the safe operation of the aircraft.

3.2.3. All AFMs are identified by a part number like any other critical part of the aircraft. The primary source for identifying the AFM applicable to a particular aircraft is the Type Certificate Data Sheet (TCDS). If there is uncertainty as to which AFM is applicable to a particular aircraft, the type certificate (TC) holder or the manufacturer can provide that information based on the make, model and serial number of the aircraft.

3.2.4. An AFM is usually clearly identified as an AFM. For some older aircraft, the AFM may be referred to as the Pilot's Operating Handbook (POH), Owner's Handbook or Owner's Manual.

3.2.5. In order for the AFM to be approved, the applicant must satisfy SACAA that the manual would comply with the applicable airworthiness standards. For type certificated aircraft, the applicable airworthiness standards are included in Parts 23, 25, 27 and 29 (and similar, as applicable).

3.3. Format of AFMs

3.3.1. An AFM may consist of approved and unapproved parts.

- 3.3.2. Approved parts of the AFM are approved by the applicable national aviation authority (NAA), based on the type certification requirements effective at the time of certification. The content of approved parts of the AFM must satisfy requirements of FAR 23.2620, 25.1581, 27.1581 or 29.1581, or equivalent, as applicable.
- 3.3.3. Unapproved parts of the AFM are provided by the manufacturer additionally, as deemed necessary for the safe operation of the aircraft, and cannot conflict with approved parts of the AFM. Each approved part of the AFM should be clearly distinguished from any unapproved part of that AFM.
- 3.3.4. Some older AFMs comply with older airworthiness standards and may contain only unapproved information, provided by the manufacturer as deemed necessary for the safe operation of the aircraft.

3.4. Provisions of AFMs

- 3.4.1. Aircraft must be provided with a type of AFM, placards or a combination of AFM information and placards, as applicable, according to the relevant certification basis.
- 3.4.2. Aircraft certificated under older certification requirements or under some special categories may not be required to be provided with an AFM. The following aircraft may not be required to have an AFM:
 - 3.4.2.1. aircraft up to a MTOW of 2,722 kg (6,000 lb) manufactured and flown prior to 1 March 1979
 - 3.4.2.2. historic and ex-military aircraft
 - 3.4.2.3. hang gliders
 - 3.4.2.4. ultralight aircraft
 - 3.4.2.5. gyroplanes
 - 3.4.2.6. weight shift controlled aeroplanes and powered parachutes
- 3.4.3. Gliders, powered sailplanes and manned free balloons are required to have an AFM if required by the applicable airworthiness standards.
- 3.4.4. Aircraft, other than those mentioned under paragraph 3.4.2 are all required to have an AFM.

4. APPROVAL OF CHANGES TO AFMs

- 4.1. If a design change (e.g. modification/repair design or STC) or compliance with the regulations necessitates a change to the AFM for the applicable aircraft, then the AFM change must be approved. This would include designs that change the crew/aircraft interface or the aircraft configuration (and are not already covered by the existing AFM).
- 4.2. The applicant for the design change, the applicant for complying with other specific regulations or the registered operator of the aircraft may apply for a change to the AFM.
- 4.3. In order for the change to be approved, the applicant must satisfy SACAA, that the manual, as changed, would comply with the applicable airworthiness standards or with the intended regulation, as applicable. For type certificated aircraft this should include 23.2620, 25.1581, 27.1581 or 29.1581 (or similar, as applicable).
- 4.4. The showing of compliance for a change to an AFM associated with a modification/repair design should be covered in the technical data approved for the modification/repair design.
- 4.5. The showing of compliance for a change to an AFM generated by requirements of a specific regulation, including applicable operational regulations, should be covered in the technical data prepared in accordance with the requirements supporting the applicable regulation.

- 4.6. The AFM amendment or supplement should be in the same format and structure as the existing AFM, and should clearly specify the design change or other approval to which the amendment or supplement relates. It is not necessary to exactly replicate every aspect of the AFM format, but the amendment or supplement should be as similar as practicable in order to facilitate its use.
- 4.7. If the aircraft does not have an AFM and a design change or the compliance with a specific regulation affects the information that would normally be contained in an AFM, then an AFM supplement must be generated and approved. However, if the information that would normally be provided in an AFM is provided by placards in the aircraft, and a design change necessitates a physical change to the placards, then that change should be approved as part of the design change.

4.8. Compatibility with the Applicable TC or STC

- 4.8.1. An approved AFM supplement can only be used with an aircraft's AFM if its certification basis is compatible with that AFM. AFM supplements usually have a statement at the front of the document clarifying the applicability of the information included in the supplement. Such statements may include listing AFM part numbers, aircraft serial numbers, variants of the applicable aircraft model, year of manufacture, etc.
- 4.8.2. In some cases, aircraft of the same type and model may have different type certification bases requiring different AFMs. For example, an aircraft that has received both EASA and FAA certification will have separate AFMs approved by each NAA. In this case, an FAA approved AFM supplement cannot be used directly with the AFM approved by the EASA as the two TCs will differ in some details from each other.
- 4.8.3. In other cases, aircraft of the same type and model and the same type certification basis may have different AFMs according to serial number and year of manufacture.
- 4.8.4. Each aircraft is manufactured in accordance with an approved TC and TCDS. For foreign aircraft type certificated by the NAA of a recognised country, these are referenced in the SACAA type acceptance certificate (TAC). When the aircraft is modified and a new AFM supplement or AFM amendment is required, the applicable certification basis for the finding of compliance and approval of that supplement or amendment must be decided in accordance with Part 21 requirements and the TC/TCDS/TAC applicable to the manufactured aircraft, as recorded on its data plate.
- 4.8.5. The registered operator of an aircraft is responsible for ensuring that only compatible AFM supplements are used with a particular AFM.

4.9. Airworthiness Statements Related to Aircraft Configuration, Operational Capability and Other Limitations

- 4.9.1. Some design changes require the AFM or AFM supplement to include an airworthiness statement regarding the configuration, operational capability and/or limitations of the aircraft for certain operations. In such cases, it is the responsibility of the applicant for the design change to include all required airworthiness statements in the AFM amendment or AFM supplement when applying for approval of the AFM or AFM supplement. For specific information on airworthiness statements, the applicant should refer to the regulations and guidance material relevant to the design change.
- 4.9.2. Airworthiness statements in an AFM or AFM supplement are related to the configuration, operational capability and/or limitations of the aircraft and do not constitute as operational authorisations or approvals for the registered operator of the aircraft.

4.10. Minor Design Changes for which an AFM Supplement is not Required


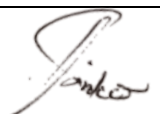
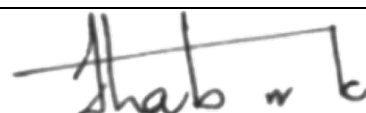
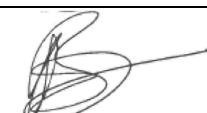
- 4.10.1. An AFM supplement for a design change is not required if ALL the following conditions are met:
- 4.10.1.1. Does not restrict, displace, or limit the use of required equipment.

- 4.10.1.2. All new limitations can be addressed via placards.
- 4.10.1.3. The aircraft performance is not negatively affected.
- 4.10.1.4. Does not require a placard per TC or STC.
- 4.10.1.5. VFR use only.
- 4.10.1.6. The equipment is non-essential to safe flight of the aircraft.

5. MAINTENANCE OF AFMs

- 5.1. The registered owner or operator of an aircraft must ensure that the AFM is always appropriate for the aircraft, having regard to:
- 5.1.1. any direction issued by SACAA relating to the AFM
 - 5.1.2. any modifications to the aircraft that would require amendment of the AFM (refer to section 4 for further details on approval of changes to an AFM)
 - 5.1.3. any instructions in relation to the AFM from the holder of the TC, STC or modification/repair design approval that applies to the aircraft.
- 5.2. In some cases, an aircraft may be issued with an AFM that contains AFM supplements available for the aircraft type, which have not been incorporated or are not applicable for the specific aircraft. In such cases, it is the responsibility of the registered owner or operator to clarify which supplement is and which one is not applicable to the specific aircraft. This can be achieved through several methods; however, it must be clear from the AFM document what method has been utilised for controlling non-applicable supplements.
- 5.3. The registered owner or operator of an aircraft may nominate a representative for maintaining the AFM for that aircraft; however, the responsibility for the update status of the AFM remains with the registered operator of the aircraft.

6. DOCUMENT AUTHORISATION

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