



Australian Government
Civil Aviation Safety Authority

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ADVISORY CIRCULAR

AC 21-15

Supplemental Type Certificates

Advisory Circulars are intended to provide advice and guidance to illustrate a means, but not necessarily the only means, of complying with the Regulations, or to explain certain regulatory requirements by providing informative, interpretative and explanatory material.

Advisory Circulars should always be read in conjunction with the relevant regulations.

Audience

This Advisory Circular (AC) applies to:

- applicants seeking approval of a change to a type design of a type certificated aircraft, aircraft engine or propeller
- holders of a supplemental type certificate (STC)
- approved design organisations (ADOs)
- approved maintenance organisations
- production authorisation holders.

Purpose

This AC gives information and guidance in relation to the application, assessment and approval of STCs and variations of STCs.

Status

Version	Date	Details
v3.0	August 2014	Update following regulation changes promulgated in the <i>Civil Aviation Legislation Amendment (Subpart 21.J) Regulation 2013</i> and the <i>Civil Aviation Legislation Amendment (Part 21) Regulation</i> .

For further information

For further information on this AC, contact CASA's Airworthiness and Engineering Standards Branch (telephone 131 757; email: airworthiness.standards@casa.gov.au).

Unless specified otherwise, all subregulations, regulations, Divisions, Subparts and Parts referenced in this AC are references to the *Civil Aviation Safety Regulations 1998 (CASR)*.

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1 Reference material

1.1 Acronyms

The acronyms and abbreviations used in this AC are listed in the table below.

Acronym	Description
AAT	Administrative Appeals Tribunal
AC	Advisory circular
ADO	Approved design organisation
APMA	Australian Parts Manufacture Approval
ATSOA	Australian Technical Standard Order Authorisation
CASA	Civil Aviation Safety Authority
CASR	<i>Civil Aviation Safety Regulations 1998</i>
CMR	Certification maintenance requirements
CS	Certification specifications
CVM	Conformity Verification Matrix
CVP	Conformity Verification Plan
FIS	Fabrication Inspection System
FITCOM	Fabrication in the course of maintenance
ICA	Instructions for continuing airworthiness
MITCOM	Manufacture in the course of maintenance
NAA	National Aviation Authority
PC	Production certificate
STC	Supplemental type certificate
TAC	Type acceptance certificate
TC	Type certificate
TCB	Type Certification Board
TCDS	Type certificate data sheet

1.2 Definitions

Terms that have specific meaning within this AC are defined in the table below.

Term	Definition
Aeronautical product	Any part or material that is, or is intended by its manufacturer to be, a part of or used in an aircraft, unless excluded by the regulations
Airworthiness standards	The detailed and comprehensive airworthiness code applicable to the aircraft, aircraft engine or propeller. Airworthiness standards for aircraft, aircraft engines and propellers are detailed in Parts 22 to 35.
Airworthiness requirements	The airworthiness requirements applicable under regulation 21.101. Airworthiness requirements for aircraft or aeronautical products include the airworthiness standards and any additional airworthiness requirements such as airworthiness directives (including exemptions and alternative means of compliance), Part 90 Manual of Standards, extended diversion time operations (EDTO) and approved single engine turbine powered aircraft (ASETPA).
Certification activity	A process by which CASA authorises an ADO to make a compliance determination against specified criteria, for certain applications made to CASA. If the criteria are met, the ADO gives CASA a certificate to that effect. CASA relies on the certificate to grant the final approval or authorisation. For further information relating to certification activities see regulation 21.251 and AC 21.J-01.
Class I product	A complete aircraft, aircraft engine or propeller for which a type certificate or foreign type certificate has been issued.
Class II product	A major component of a Class I product or an unapproved Class I product the failure of which would jeopardise the safety of a Class I product.
Class III product	A part or component which is not a Class I or Class II product.
Equivalent level of safety finding	A finding where literal compliance with a specific airworthiness requirement cannot be demonstrated but compensating factors exist in the design that can be shown to provide a level of safety equivalent to that intended by the certification basis.
Major change	A change that has an appreciable effect on the weight, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of the aircraft, aircraft engine or propeller.
Not significant change	A change that is not a significant change or a substantial change.
Person	An individual or body corporate.
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.
Relevant ADO	An ADO that is approved under Subpart 21.J to carry out the relevant design activity in relation to the relevant aircraft or aeronautical products.
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.
Statement of compliance	Certification, by CASA, an authorised person or an ADO, that design data has been examined in accordance with established procedures and found to comply with applicable airworthiness standard(s).
Substantial Change	A change which is so extensive that a substantially complete investigation of compliance is required, and consequently a new TC.

1.3 References

Act and Regulations

The Act and regulations are available on the ComLaw website <http://www.comlaw.gov.au/>

Document	Title
<i>Civil Aviation Act 1988</i>	
Part 21 of CASR	Certification and airworthiness requirements for aircraft and parts
Subpart 21.E of CASR	Supplemental type certificates
Subpart 21.J of CASR	Approved design organisations
Subpart 21.M of CASR	Designs of modifications of, and repairs to, aircraft, aircraft engines, propellers and appliances
<i>Civil Aviation (Fees) Regulations 1995</i>	
<i>Air Navigation (Aircraft Noise) Regulations 1984</i>	

CASA advisory material

CASA's advisory material is available at http://www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_90902

Document	Title
AC 21.J-01	Approved design organisations
AC 21-8	Approval of modification and repair designs under Subpart 21.M
AC 21-10	Experimental Certificates
AC 21-12	Classification of design changes
AC 21.16	Approval of Materials, Parts, Processes and Appliances;
AC 21-26	Certification conformity
AC 21.27	Manufacturing approval — overview
AC 21-601	Australian Technical Standard Order Authorisation
AC 21-35	Calibration – inspection and test equipment
CAAP 30-4	Certificate of Approval – Maintenance Organisation
Part 145 AMC/GM	Approved Maintenance Organisation Requirements

Other documents

International agreements

International agreement documents are available at:

http://www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_90820

ICAO Annex 16

ICAO Environmental Technical Manual (ICAO Doc 9501)

ICAO documents are available at <http://www.icao.int/>

1.4 Forms

CASA's forms are available at http://www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_91308

Form number	Title
CASA Form 655	Design Advice
CASA Form 733	Type or Supplemental Type Certificate–Application
CASA Form 724	Statement of Conformity
CASA Form 882	Conformity Inspection Record
CASA Form 979	Statement of Compliance with the Civil Aviation Regulations

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2 Introduction

2.1 What is an STC?

2.1.1 An STC is one form of approval of the design of a change to a type certificated aircraft, aircraft engine or propeller, when the change is not so extensive as to require a new type certificate (TC). An STC is supplementary to the original TC. It does not change the previously issued TC.

2.1.2 An STC may be used to approve a modification or a repair. A modification may include any one or a combination of a physical design change (including the use of alternative parts or materials), or a change to an operating envelope, performance, operating characteristics, limitations or ICA. The change can be a single change or a collection of changes.

2.2 What does an STC consist of?

2.2.1 An STC is taken to consist of the TC or type acceptance certificate (TAC) previously issued for the aircraft or aeronautical product, and each change in the type design of the aircraft or aeronautical product described or identified in the STC.¹

2.3 How many items can be covered by an STC?

2.3.1 An STC may cover changes to the type design of:

- a. only one item, identified by a single serial number (i.e. one aircraft, aircraft engine or propeller)
- b. two or more items, identified by multiple serial numbers
- c. all items of a particular type and model.

2.3.2 For an STC applicable to only one aircraft, aircraft engine or propeller (a 'one-only' STC), the technical data need not detail the production of parts and/or the installation to the degree required for an STC covering multiple items (a 'multiple' STC).

2.3.3 For an STC applicable to multiple items, the technical data must be of a quality that enables parts and the installation to be reproduced.

2.4 Who is eligible to apply for an STC?

2.4.1 Any person may apply to CASA for an STC. The aircraft, aircraft engine or propeller requiring the STC must be the subject of an Australian TC or TAC. The applicant is not required to be the holder of the TC or TAC, nor to be an ADO.

2.5 When is an STC required?

2.5.1 An STC is required when major changes to type certificated aircraft, aircraft engines or propellers are classified as significant changes but not as substantial changes.

2.5.2 Major changes that are not significant changes may be considered for approval under Subpart 21.M after submission of a Design Advice (see section 3). A substantial change will

¹ See regulation 21.117.

require a new TC in accordance with regulation 21.019. For more information on classification of changes see section 10 and AC 21-12.

2.5.3 An STC is necessary for each type certificated aircraft or aeronautical product affected. In some cases, more than one STC may be necessary, for example, if an engine is modified the applicant may require one STC to approve the engine modification and a second STC to approve the installation of the modified engine on an aircraft (in instances when the installation results in a significant change that requires an airframe STC).

2.5.4 An STC is also required when a flight manual supplement is required for a certification category change (e.g. changing an aircraft from 'normal' category to 'utility' or 'restricted' category), even though there may be no physical change to the aircraft.

2.5.5 In some cases an STC can be issued to approve a change to ICAs, including Airworthiness Limitations. For example, an increase to a time between overhaul (TBO) limitation.

2.6 When an STC cannot be issued

2.6.1 An STC can only be issued for a type certificated aircraft, aircraft engine or propeller. Therefore, an STC cannot be issued for an aircraft, aircraft engine or propeller that does not have an Australian TC or TAC, which includes Class II or Class III products (e.g. appliances, parts, components, instruments) and Australian Technical Standard Order articles.² Change of ownership/transferability

2.6.2 The STC holder (i.e. the transferor) may transfer the STC to another person (i.e. the transferee) without CASA's prior approval.³ However, the STC may be transferred only with the written consent of the transferee. The transferor must:

- a. give the transferee the STC, including all associated technical data, documents and records that they must keep in order to fulfil the regulatory obligations of an STC holder
- b. give CASA a written notice within 30 days after the transfer of the STC stating:
 - i. the date of the transfer
 - ii. the name and address of the transferee.

2.7 Licensing of an STC

2.7.1 The STC holder (i.e. the licensor) may confer the benefits of the STC on another person (i.e. the licensee), without CASA's prior approval, by making a written licensing agreement with the licensee. The licensor must give CASA a written notice of the licensing agreement within 30 days of the arrangement being made.

2.8 Validity of an STC

2.8.1 An STC remains valid until it is surrendered by the STC holder for any reason or CASA cancels or suspends the STC under the regulations.

2.8.2 A foreign STC remains in force until cancelled or suspended by CASA or the NAA of the issuing country.

2.8.3 An STC or a foreign STC is also not in force for any period of suspension of the TC previously issued to the aircraft, aircraft engine or propeller.

² See regulation 21.611 for design changes to Technical Standard Order articles.

³ See regulation 21.120.

2.9 Cancellation or suspension

2.9.1 CASA may cancel or suspend an STC if CASA considers it to be in the interests of aviation safety. If CASA takes such action, CASA will give detailed reasons for the cancellation or suspension of the STC in a written notice sent to the STC holder. This notice will state:

- a. the grounds for cancellation or suspension
- b. when the cancellation or suspension takes effect
- c. for a suspension, when the suspension is no longer in effect.

2.9.2 CASA expects that STC holders will have the engineering expertise necessary to provide continued airworthiness support for the design covered by their STC. An inability on the part of the STC holder to provide such support in relation to the STC may, in the case of occurrences that necessitate ongoing technical support, constitute grounds for cancellation or suspension of the STC. The STC holder may obtain the necessary expertise from another consultant/organisation.

2.9.3 CASA may cancel or suspend foreign STCs in interest of aviation safety.

2.9.4 If CASA cancels or suspends an STC or a foreign STC it must publish a notice in the *Gazette*. A cancellation or suspension takes effect on the day after the notice is gazetted, or at a later time specified in the notice. During any suspension period, the requirement to keep certain records and produce these to CASA remains in force.

2.10 Review of CASA decisions by the AAT

2.10.1 An STC holder may, in accordance with regulation 201.004 apply to the AAT for review of CASA's decision in regards to any of the decisions in table 201.004 of CASR.

2.11 Written permission statement to use an STC

2.11.1 An STC holder should keep a record of all aircraft or aeronautical products that have been changed in accordance with the STC in order to fulfil their responsibilities as the STC holder (see subsection 7.1).

2.11.2 If the STC holder permits another person to use the STC to make changes to one or more aircraft or aeronautical products then the STC holder should provide that person with written evidence in the form of a Permission Statement. The Permission Statement should contain the following:

- a. the STC number
- b. identification of the person being given permission to use the STC
- c. a statement regarding the permission and any limitations applied to the permission, defining those items that may be changed
- d. an instruction that requires the person to give the STC holder the registration mark and/or serial number of each aircraft or aeronautical products that was changed in accordance with the STC.

2.11.3 Depending on the nature of the permission, additional information should be listed in the Permission Statement, including the duration of the permission and the number of times the STC may be used for fleets of aircraft.

2.12 International recognition of STCs

2.12.1 Regulation 21.114 provides for the automatic acceptance of foreign STCs (however described) issued by the National Aviation Authority (NAA) of recognised countries (including EASA)⁴, provided the certification basis used for the STC matches the certification basis stated on the Australian TC or TAC for the aircraft, aircraft engine or propeller.

2.12.2 Not all Australian STCs are automatically accepted by foreign NAAs. However, an Australian STC is more likely to receive ready acceptance outside Australia than a design change approved under Subpart 21.M.

2.12.3 International agreements between Australia and other countries are available on the CASA website.

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⁴ See AC 21-30 for a list of recognised NAAs.

3 Modification or repair without an STC

3.1 Modifications or repairs under Subpart 21.M

3.1.1 Modification/repair designs that constitute minor changes to the type design may be approved under Subpart 21.M. In certain situations CASA may also specifically authorise major changes that are not significant or substantial changes to be approved under Subpart 21.M. General examples of design changes that should be processed as an STC include:

- a. the design introduces a significant change to the data or limitations mentioned in the TC or TAC for the aircraft, aircraft engine or propeller
- b. the design changes airworthiness limitations or CMRs for the aircraft, aircraft engine or propeller
- c. the design is a major change for more than one aircraft, aircraft engine or propeller serial number – exceptions may be made in special or unique situations, such as: a limited application of a major modification to a very small fleet of aircraft or special mission applications, or unique one off modifications intended for a small and limited number of aircraft.
- d. the parts to be manufactured for the design are complex, for example, exceeding what would be appropriate for FITCOM/MITCOM.

3.1.2 CASA may issue STCs for repetitive modifications or repairs that were previously approved on an individual basis under Subpart 21.M.

3.1.3 Design changes that were classified as major because of an association with an airworthiness directive may be considered for approval under Subpart 21.M via submission of a Design Advice.

3.1.4 For more information on classification of changes see section 10 and AC 21-12.

3.1.5 See AC 21-8 for more information on approval of modification/repair designs under Subpart 21.M.

Note: Difficulties can arise if a design change is approved under Subpart 21.M and the aircraft or aeronautical product is subsequently exported to a country whose NAA requires an STC to cover the change.

3.2 Initial approval as a modification under Subpart 21.M and subsequent application for an STC

3.2.1 In some cases, a person may seek to have a modification design approved under Subpart 21.M with the intention of obtaining an STC at a later date. For example, to evaluate the market or to conduct further research into the modification's reliability performance before committing to an STC.

3.2.2 The quality and content of the technical data package for a major modification approved under Subpart 21.M is expected to be essentially the same as that for an STC; however, there may be some differences in the approval process for the STC. For example, if the modification/repair design only for one item whereas the STC is for multiple items, or if CASA requires additional testing or to witness certain tests and inspections.

3.3 Initial approval pending issue of an STC

3.3.1 In some cases, an applicant desires that the aircraft returns to service before CASA can issue the STC. A suitably qualified Subpart 21.M authorised person or a relevant ADO may apply to CASA, via a Design Advice, requesting authorisation to grant a temporary approval under regulation 21.437 for that particular aircraft, pending issue of the STC. CASA may also grant a temporary approval under regulation 21.435.

3.3.2 If the modification is approved under Subpart 21.M, the registered operator of the aircraft must ensure that the aircraft records are updated accordingly (the design approval holder must provide the relevant information to the registered operator). When the Subpart 21.M approval ceases and the STC is approved, the registered operator must update the aircraft records accordingly. This must include a review of the relevant documents to confirm the configuration of the aircraft against the approved STC.

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4 Application for an STC

4.1 Initial proposal

Who can apply?

4.1.1 Any person may apply for an STC. However, if the applicant is not familiar with modification design approval process then the applicant may engage the services of an ADO or consultant experienced in this type of design activities to assist with technical matters.

4.1.2 The ADO or consultant selected by the applicant may act as the coordinator for the project. Upon the request of the applicant, CASA communications concerning the project will be addressed or copied to the coordinating ADO or consultant.

4.1.3 The person to whom the STC is issued becomes the STC holder and has responsibility for the continuing airworthiness support for the approved design change. The holder must be able to demonstrate their capability to fulfil these responsibilities, which may include a written agreement with an ADO or other suitably competent person.

How to apply?

4.1.4 The applicant should submit to CASA a completed Form 733. The application should be accompanied by:

- a. a technical description of the change
- b. the proposed certification basis
- c. a certification plan, including an outline of the means that will be used to demonstrate compliance with the applicable airworthiness requirements⁵
- d. a conformity plan.

4.1.5 An application may be submitted prior to commencement of the physical design work so that CASA can provide initial advice in relation to how the design change may be approached, or even whether approval is feasible.

Where to apply?

4.1.6 All applications for issue of, or changes to, an STC must be lodged with CASA's Initial Airworthiness Section. The application form should be sent to aircraft.certification@casa.gov.au. The Initial Airworthiness Section can be contacted by telephone on 13 17 57.

Payment of fees

4.1.7 CASA charges an hourly fee to process an application for an STC (including tasks such as data assessment, compliance checking and witnessing certification tests), as specified in Schedule 1 to the *Civil Aviation (Fees) Regulations 1995*. The applicant must pay the estimated fee before CASA will begin to assess the application.⁶

4.1.8 When issuing STCs, CASA follows an estimate/payment/settlement procedure:

- a. the CASA office that receives the application prepares a fee estimate and advises the applicant

⁵ See subsection c for more information on the compliance plan.

⁶ In accordance with section 97 of the *Civil Aviation Act 1988*, CASA may not process an application until the fee is paid in advance.

- b. the applicant pays the estimated fee⁷
- c. CASA records actual work-hours expended as the task is undertaken
- d. CASA issues a settlement statement just before the STC is issued. If CASA overestimated the fee, CASA issues a refund to the applicant. If CASA underestimated the fee, the applicant must make the final payment before the STC will be issued.

4.2 Design standard and certification basis

4.2.1 The design standard for an STC is specified in subregulation 21.101(1) as either:

- a. the regulations mentioned as the 'certification basis' in the TC, TAC or the foreign TC for the aircraft or aeronautical product, or
- b. the applicable regulations in effect at the time of application and any other amendments that CASA is satisfied are directly related.

4.2.2 CASA's response to an STC application will include the following, as applicable:

- a. the certification basis for the proposed STC, including:
 - i. applicable airworthiness standards
 - ii. exemptions
 - iii. special conditions of airworthiness
 - iv. equivalent level of safety findings
- b. comments on, or acceptance of, the certification plan
- c. identification of any aspects of the 'showing compliance' process that CASA wishes to witness or inspect.

4.2.3 It should be noted that, while the certification basis for an STC is established very early in the approval process, in some cases the final certification basis of a changed aircraft or aeronautical product may end up being different from that established initially. The difference(s) may occur when CASA issues exemptions, special conditions of airworthiness or findings of equivalent level of safety during the approval process. Usually, at the beginning of the application process the applicant for the STC identifies the need for the issuance of these as part of their proposed certification basis. However, the need to change the certification basis of the type certificated aircraft or aeronautical product may not be obvious at the beginning, and becomes evident only during the course of the actual STC modification approval activities.

4.2.4 At the conclusion of the approval activities, CASA will identify all exemptions, special conditions, equivalent level of safety findings and other voluntary compliance that transpired during the approval process, as part of the final certification basis for the STC.

4.2.5 See AC 21-12 for more information on establishing the certification basis for an STC.

⁷ For major STC projects, the applicant may be able to negotiate with CASA to pay in instalments.

5 Type Certification Board (TCB)

5.1 When a TCB is required

5.1.1 Depending on the complexity of the project, a TCB is not always required for STC projects. A TCB will generally be required for STC projects involving significant changes to the type design.

5.2 Purposes of a TCB

5.2.1 The purposes of a TCB are to:

- a. acquaint the applicant and CASA with the certification project
- b. resolve significant problems
- c. establish a schedule for the overall accomplishment of the type certification program.

5.3 TCB members

5.3.1 The TCB members should include:

- a. the CASA Manager, Initial Airworthiness, or their nominee, who is the Chair of the TCB
- b. the project team
- c. the applicant and their nominated engineering representatives.

5.4 TCB meetings

5.4.1 Meetings may be held as requested by CASA or the applicant. These meetings help minimise risk of doubt or misunderstanding between CASA and the applicant. TCB meetings may include the following, as necessary/applicable:

- a. **Familiarisation TCB meeting.** The familiarisation TCB meeting is held to:
 - i. explain the need for certification
 - ii. provide an overview of the certification process
 - iii. explain CASA's role
 - iv. detail the applicant's responsibilities
 - v. discuss the certification basis
 - vi. explain CASA's cost-recovery policy.

Note: The familiarisation TCB meeting may be combined with the preliminary TCB meeting.

- b. **Preliminary TCB meeting.** The preliminary meeting is held to:
 - i. acquaint CASA personnel with the project
 - ii. discuss and finalise the certification basis
 - iii. permit discussion of design details and possible problem areas with specialists
 - iv. identify areas needing the formation of special compliance teams to attain the earliest possible resolution of potential problems
 - v. identify novel or unique design features, materials or processes
 - vi. discuss conformity aspects of the application prior to any manufacture or testing activities
 - vii. establish a schedule for the certification program
 - viii. finalise the certification plan prepared by the applicant to include involvement of CASA.

- c. **Progress TCB meetings.** Progress TCB meetings may be required to resolve problems that arise during the type certification program. Progress meetings may be requested by CASA or the applicant and need only involve the necessary participants.
- d. **Pre-CASA flight TCB meeting.** The pre-CASA flight TCB meeting is held to discuss and clarify any questions the applicant may have about the required CASA flight testing.
- e. **Final TCB meeting.** The final TCB meeting is held when CASA determines that the applicant has demonstrated compliance with all applicable airworthiness requirements. The final TCB meeting is held to:
 - i. review all outstanding items, such as the supplemental TCDS, AFM, continued airworthiness program and items on which there may be some question of compliance with the established airworthiness standard
 - ii. determine the status of any outstanding technical data
 - iii. decide whether to issue the STC.

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6 STC approval process

6.1 Entitlement to an STC

6.1.1 The applicant is entitled to the STC if CASA is satisfied that:

- a. the altered aircraft, aircraft engine or propeller meets the applicable airworthiness requirements; and
- b. no feature or characteristic of the change in type design makes the altered aircraft, aircraft engine or propeller unsafe for its intended use.

6.1.2 CASA may satisfy itself that the design meets the above criteria on the basis of any, or a combination, of the following:

- a. an examination of the design
- b. the technical data for the design approved under regulation 21.009 by an ADO or authorised person
- c. a certificate from an ADO authorised to carry out a certification activity in relation to the design.

6.2 Certification plan and statement of compliance

6.2.1 The applicant should prepare a certification plan for the STC approval project. This constitutes an agreed plan of action and is the principal guidance plan for the entire STC certification process/project. A certification plan should include the following information:

- a. project description, including the applicant and aircraft or aeronautical product(s) involved
- b. proposed certification basis, including:
 - i. applicable airworthiness standards
 - ii. exemptions
 - iii. special conditions
 - iv. equivalent level of safety findings
- c. the compliance plan – a detailed explanation of the means and methods that will be used to show compliance with the applicable airworthiness requirements, including documentation to be provided, test plans and schedules
- d. the certification activities (ADO) or agreed level of delegation or authorisation granted to authorised persons or the applicant for each applicable requirement
- e. the agreed level of involvement of certification team members (CASA specialists and ADO/authorised persons) for each applicable requirement
- f. project schedule, including major milestones and deliverables
- g. a communication plan, describing communication and coordination responsibilities between the applicant, CASA, ADO, authorised persons and suppliers, as applicable
- h. a conformity verification plan (CVP) that sets out how and by whom conformity will be established.

6.2.2 The applicant should prepare a draft statement of compliance. The draft statement of compliance needs to indicate the proposed means of showing compliance with all applicable airworthiness requirements. For systems that contain software, the plan for software aspects of the certification should also be submitted at this stage.

6.2.3 The certification plan and statement of compliance should be submitted to CASA. CASA will respond to the draft statement of compliance, providing agreement or comments as applicable, and the necessary authorisations for ADOs and authorised persons to carry out certification activities and data approvals.

6.2.4 As the project progresses, the draft statement of compliance and the certification plan will need to be continually revised. An ongoing dialogue with CASA should be conducted during the life of the project.

6.3 Certification activities

6.3.1 Certification activities are an option available to the applicant for the finding of compliance. An ADO may carry out a certification activity to make a determination that:

- a. the altered aircraft, aircraft engine or propeller would comply with the applicable airworthiness requirements (the scope may include any or all of the applicable airworthiness requirements)
- b. no feature or characteristic of the change in type design makes the altered aircraft, aircraft engine or propeller unsafe for its intended use.

6.3.2 The determination by the ADO will normally be accepted by CASA, in accordance with the agreed certification plan, as the finding of compliance for the relevant requirement(s).

6.3.3 However, an ADO may carry out a certification activity only if:

- a. the certification activity is within the ADO's scope of approval;
- b. the applicant for the STC nominates the ADO to CASA in writing; and
- c. CASA specifically authorises the ADO to carry out the certification activity in relation to the particular STC application (the scope of the activity must be specified by CASA in the authorisation notice).

6.3.4 The certification activity engineering report and certificate from the ADO should be included in the STC engineering substantiation data package.

6.4 Engineering substantiation data package

6.4.1 The applicant should submit the required engineering substantiation data package for the design change to the CASA office assigned to the project.

6.4.2 The data package should include all the technical data for the design that:

- a. describes the design, such as drawings, sketches, marked photographs, process specifications; and
- b. shows that the design complies with the applicable airworthiness requirements, such as analyses, test plans and reports.

6.4.3 In particular, the data package should include:

- a. all drawings, specifications, analysis reports, calculations and other data necessary to demonstrate compliance
- b. information on the configuration, materials and processes
- c. structural and/or functional test reports
- d. flight test reports, if required
- e. all certificates and reports from any certification activities and technical data finding compliance for the design.

6.4.4 The TC holder would typically consider the original type design or technical data to be commercial-in-confidence proprietary information. Persons seeking to substantiate the design of an STC may find the TC holder unwilling to release the original data. In such cases, the applicant will be required to generate their own data to show compliance with the applicable airworthiness requirements.

6.4.5 See AC 21-23 for more information on technical data.

6.4.6 'One-only' STC descriptive data

6.4.6.1 Descriptive data requirements for a 'one only' STC are different than the requirements for a 'multiple' STC. However, the same level of safety is required for either type of STC.

6.4.6.2 A 'one-only' STC descriptive data package applies to only one installation/modification. The package may consist of marked-up photographs, sketches, written descriptions, marked-up excerpts from manufacturers' parts catalogues and maintenance manuals, and similar document excerpts. If the data consists of other than drawings, the data must be of sufficient quantity and quality to properly ascertain the nature of the modification. This includes defining all critical equipment, parts, and attachments, and identifying any components of the original product that were removed.

Note: Excerpts from parts catalogues alone are not sufficient. Finding of conformity in accordance with AC 21-26 is still applicable.

6.4.7 'Multiple' STC descriptive data

6.4.7.1 A 'multiple' STC descriptive data package should completely and accurately describe the fabrication, assembly, and installation of all portions of the modification. The descriptive data must be adequate for reproduction of parts and/or installation of subsequent modifications on other serial numbers of the same model type-certificated product. An acceptable package includes, but is not limited to:

- a. engineering drawings
- b. material and manufacturing processes
- c. specifications and tolerances
- d. data necessary for fabrication of all parts and assemblies
- e. installation drawings and/or instructions.

6.5 Evaluation and approval of data

6.5.1 The technical data for the design must be evaluated and approved in accordance with the agreed certification plan, either by CASA or an ADO or authorised person.

6.5.2 The applicant should submit the engineering substantiation data package in a logical format for approval in accordance with the agreed certification plan.

6.5.3 Evaluation and approval of data by an ADO or authorised person

6.5.3.1 CASA may accept a finding of compliance made by an ADO or authorised person in accordance with the agreed certification plan. CASA's level of involvement in the project to find compliance with the airworthiness requirements will be reduced to the minimum necessary depending on the capabilities of the ADO(s) or authorised person(s) approving the technical data.

6.5.3.2 Findings of compliance by an ADO or authorised person must be in the form of a certification activity certificate or technical data approved under regulation 21.009.

6.5.3.3 CASA may also accept technical data as described under regulation 21.008 approved by a recognised NAA or by a person authorised by the NAA of a recognised country to approve data for equivalent modifications or repairs. For example, a Designated Engineering Representative of the Federal Aviation Administration of the United States of America.

6.5.4 Evaluation and approval of data by CASA

6.5.4.1 CASA's role in the approval process is to establish compliance of the proposed design change with the applicable airworthiness requirements. CASA will not generally approve data for a design in advance of granting the final approval as an STC. CASA will return any data deemed unacceptable, with a summary of perceived deficiencies and a request for the applicant to revise and resubmit the data. It is the applicant's responsibility to resolve any deficiencies in the design (the applicant may engage the services of appropriately qualified and experienced consultants or an ADO to assist with the technical matters).

6.6 Test plans

6.6.1 Required tests should be identified in the certification plan. Test plans must be accepted by CASA prior to conducting the test. The test plans should include all necessary details of:

- a. test fixtures and articles (i.e. parts, components or subassemblies)
- b. loading proposals
- c. pass/fail criteria
- d. schedules for any structural, system, reliability or endurance tests
- e. calibration of measuring equipment, including aircraft instrumentation if appropriate.⁸

6.7 Physical modification of the prototype and conformity

6.7.1 If a prototype is necessary, the applicant's certification plan should contain a procedure to approve data for the purpose of prototype manufacture. Physical work on the change may only proceed if data is approved in accordance with this procedure. It will be necessary to inspect parts and/or subassemblies to establish conformity with the approved data.

6.7.2 Applicants should perform their own conformity inspections in accordance with subregulation 21.033(2). The person performing each conformity inspection is to complete a conformity inspection record using CASA Form 882. The applicants should then submit conformity inspection reports to CASA using CASA Form 724.⁹ The conformity inspections and certification tests must be carried out and witnessed in accordance with the approved conformity and test plans.

6.7.3 When CASA receives a conformity inspection report from the applicant, it may carry out conformity inspections to verify the report. Once all conformity inspections are completed to CASA's satisfaction, the applicant should perform all required ground tests in accordance with the approved test plan. The CASA project engineer, an authorised person or an ADO (as specified in the compliance plan) will witness all tests and conduct any necessary compliance inspections.

⁸ See AC 21-35 for further information regarding calibration of equipment and tools.

⁹ Paragraph 21.033(1)(b) requires that no change may be made to any part of the test article between the time that compliance with subregulation 21.033(2) has been shown and the time it is presented to CASA for test.

6.7.4 The CVP and inspections should be prepared, agreed and executed in coordination and agreement with CASA. See AC 21-26 for guidance on certification conformity, including acceptable means of compliance and samples of a CVP and Conformity Verification Matrix (CVM).

6.8 Submission of test reports

6.8.1 The applicant should submit to CASA all test reports and substantiating data, including test equipment calibration reports for all certification testing, as well as any further data necessary to demonstrate compliance with the applicable design standards.

6.8.2 If an aircraft will be subject to flight testing then it may be necessary for the applicant to develop a loading system and have it approved by a weight control officer.

6.9 Conduct of the flight testing

6.9.1 If applicable, prior to flight testing, the applicant should submit to CASA a flight test proposal describing the proposed conduct of the flight testing for review. This review helps minimise risk of doubt or misunderstanding between CASA and the applicant concerning requirements for flight testing.

6.9.2 The applicant must also:

- a. establish compliance with subregulation 21.035(4) regarding emergency egress from the aircraft and any use of parachutes
- b. obtain an experimental certificate for showing compliance with the regulations to cover the intended flight testing, in accordance with regulation 21.191.¹⁰

6.9.3 The applicant must successfully complete the flight testing in accordance with the flight test proposal. Following the flight testing, a report must be submitted to CASA. CASA will review the applicant's flight test report for compliance with regulation 21.035 and other applicable regulations. Upon acceptance, CASA may commence any required flight testing to ensure the validity of the flight test report(s).¹¹ The applicant must complete all the flight tests required and CASA can review/ conduct flight tests to verify any or all of the flight tests conducted by the applicant.

6.9.4 On successful completion of any required flight testing, CASA will prepare a flight type inspection report and will attach the applicant's flight test report as an appendix. CASA will notify the applicant of any changes that are required, including changes to the flight test report, changes to rectify non-compliances, and changes to be made to the flight manual supplement.

6.10 Submission of final data

6.10.1 The applicant should compile a consolidated data set, including all certificates from certification activities, a final version of the compliance statement, and all updates, to reflect the article as tested by CASA, plus any required changes.

6.10.2 The applicant should, if authorised to do so in the agreed certification plan, mark all technical data, including drawings, reports and process specifications, as being approved pursuant to regulation 21.009, before submitting the entire package to CASA.

¹⁰ See AC 21-10 for more information on experimental certificates.

¹¹ See subregulation 21.039(2)

6.10.3 The applicant must also submit to CASA (as applicable) the instructions for continuing airworthiness; proposed change(s) to the flight manual and list of data required to be included in of the supplemental TCDS.

6.11 Issue of the STC

6.11.1 CASA will review all submitted data, certificates from certification activities and any changes to the flight manual (if applicable). If the applicant has complied with the regulations and the cost recovery procedures¹² then CASA will issue the STC.

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¹² See paragraph 4.1.7.

7 Responsibilities

7.1 STC holder's responsibilities

7.1.1 The STC holder must supply instructions for continuing airworthiness to registered operators of aircraft in which the STC modification has been incorporated.

7.1.2 The STC holder must also report to CASA any failure, malfunction or defect that may affect the continuing airworthiness of the aircraft.¹³ CASA uses this information to determine if an unsafe or potentially unsafe condition exists in an aircraft.

7.1.3 The STC holder remains responsible for the continued integrity of the change to the type design and must continue to be CASA's contact point for resolving issues if corrective action is required. To fulfil this responsibility, the holder should have the capability, or have access to the capability, to provide ongoing technical support for service difficulties and when CASA requires mandatory corrective action.

7.1.4 If an STC is transferred to another person by written agreement, the new STC holder assumes the responsibilities of the STC holder, as described in this subsection.

7.2 Registered operator's responsibilities

7.2.1 Registered operators have the overall responsibility to ensure the compatibility of all design changes incorporated in their aircraft. When contracting a maintenance provider to incorporate any aircraft modification(s), the operator should provide the information on all existing design changes made to the aircraft so that compatibility may be verified.

7.2.2 The registered operator should report any indication of design change incompatibility that may arise during installation or in service to the STC. The registered operator should notify the STC holder of a defective STC or the requirement for assistance to vary the STC. In all cases of incompatibility between an STC and modifications/repairs installed on the aircraft, the registered operator must resolve the incompatibility (in conjunction with the designers/holders of the relevant design changes) and ensure that the modified aircraft continues to comply with the applicable airworthiness requirements and is in a condition for safe operation.

7.2.3 Registered operators should notify the CASA Civil Aircraft Register¹⁴ when an STC is installed in their aircraft and if:

- a. the STC changes the aircraft model
- b. a new engine or propeller is installed (unless this occurs, CASA may not be aware of a new type of engine or propeller installed in the Australian fleet, and fail to issue continuing airworthiness information relating to that engine or propeller)
- c. the aircraft's maximum take-off weight is changed.

7.3 Installer's responsibilities

7.3.1 The STC is normally approved based on a specific aircraft configuration. As additional modifications are installed, the unexpected interface and interaction with those modifications can be significant.

¹³ See regulation 21.003.

¹⁴ Contact details of Civil Aircraft Register are available on the CASA website at http://www.casa.gov.au/scripts/nc.dll?WCMS:STANDARD::pc=PC_93247.

7.3.2 It is the responsibility of the installer, as well the registered operator, to ensure that the modification design is approved and can be installed in accordance with the supplied instructions.¹⁵ STC holders should provide their clients or customers with a copy of the approval document for this purpose.

7.3.3 The installer must take into consideration that the particular aircraft may have other modifications/repairs that impact upon the incorporation of the STC modification. If a modification cannot be incorporated in accordance with the supplier's instructions, or if it would be incompatible with other modifications/repairs, then an assessment of the aircraft by an authorised person or ADO and/or amendment of the STC is required to ensure there are no adverse consequences.

7.3.4 In all cases, the installer may not attempt to make any unapproved changes to an STC. The basis for compliance with the airworthiness requirements is not always obvious and it cannot be assumed that a small change would be trivial. Any change to the STC to ensure necessary compatibility must be separately approved.

¹⁵ The STC must cover the Australian aircraft, either by serial number or by other reference, such as all models of a nominated aircraft.

8 Production of parts for an STC

8.1 Introduction

8.1.1 Parts for a modification/repair design may be produced by the following means, or a combination thereof (see AC 21.27 for more information on manufacturing approvals):

- a. Production certificate
- b. FITCOM/MITCOM
- c. Australian Parts Manufacturing Approval (APMA) – see also AC 21-16
- d. Australian Technical Standard Order authorisation (ATSOA) – see also AC 21-601.

8.1.2 The method used will depend on the complexity of the part(s) required for the STC.

8.2 Production certificates

8.2.1 Production certificates under Subpart 21.G may be obtained for production of parts included in a STC.

8.2.2 A one-off production certificate may be granted in cases where the application is limited, but the parts are not within the scope of FITCOM/MITCOM. For example, the design includes a Class II product.

8.2.3 See AC 21-14 for more information on production certificates.

8.3 FITCOM/MITCOM

8.3.1 Certain kinds of parts may be fabricated or manufactured in the course of maintenance (FITCOM/MITCOM) by a maintenance organisation. FITCOM applies for Part 42 aircraft and Part 145 Approved maintenance organisations (AMOs); MITCOM applies to maintenance organisations holding an approval under regulation 30 of CAR and aircraft subject to Part 4A of CAR.

8.3.2 FITCOM/MITCOM is for simple Class III products that are to be used on an aircraft on which the maintenance organisation is carrying out maintenance (e.g. hoses, brackets, cables) – parts made under FITCOM/MITCOM cannot be issued an authorised release certificate and cannot be onsold.

8.3.3 See the Part 145 AMC/GM and CAAP 30-4 for more information on FITCOM and MITCOM respectively.

9 Variation of an STC under regulation 21.120B

9.1 Changes for which regulation 21.120B are applicable

9.1.1 Regulation 21.120B is applicable to minor changes as described in regulation 21.093 that would not necessitate a change to the certificate.

9.2 Who can apply to vary an STC?

9.2.1 The STC holder may apply, in writing, for a variation of the STC.

9.3 Who do you apply to?

9.3.1 This application may be to CASA, an authorised person or a relevant ADO.

9.3.2 An authorised person or ADO may only approve a variation of an STC within the scope of their authorisation, which will generally be limited to specified STCs for which they are the holder or have a written agreement with the STC holder to approve variations.

9.4 What must an authorised person or ADO do?

9.4.1 If the application is made to an authorised person or ADO, the authorised person or ADO must vary the STC if:

- a. the altered aircraft, aircraft engine or propeller complies with the airworthiness requirements in subregulations 21.101(1) and (2); and
- b. no feature of characteristic of the change makes the altered aircraft, aircraft engine or propeller unsafe for its intended use.

9.5 What must CASA do?

9.5.1 CASA must vary the STC if:

- a. the altered aircraft, aircraft engine or propeller complies with the airworthiness requirements in subregulations 21.101(1) and (2) or if a non-compliance is compensated for by factors that provide the equivalent level of safety; and
- b. no feature of characteristic of the change makes the altered aircraft, aircraft engine or propeller unsafe for its intended use.

9.5.2 CASA may also authorise an ADO to carry out a certification activity in relation to an application to vary an STC.¹⁶

9.6 Compliance with Inspections, Tests and Statement of Conformity

9.6.1 The person applying for a variation of an STC must conform with Regulations 21.033 and 21.053 for a variation of an STC, with respect to each change, as if:

- a. the application was for a TC under Subpart 21.B; and
- b. that any reference to CASA in those regulations is a reference to the authorised person or ADO the application was made to.

¹⁶ See subsection 6.3 for more information on certification activities.

10 Classification of design changes

10.1 Introduction

10.1.1 Design changes must be classified to determine the necessary means of approval and the certification basis.

10.1.2 Design changes must initially be classified as major or minor.

10.1.3 Modifications are further classified as substantial, significant or not significant, as described in the following paragraphs.

10.1.4 The classification should be made when there is sufficient data available to make an accurate classification.

10.1.5 Wherever there is doubt as to the classification of a change, CASA should be consulted for clarification via a Design Advice.

10.1.6 See AC 21-12 for more information on classification of design changes.

10.2 Major/minor classification

10.2.1 Minor changes

10.2.1.1 A minor change is one that has no appreciable effect on the weight, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of an aircraft, aircraft engine or propeller.

10.2.1.2 Minor changes may be approved under Subpart 21.M, or via an STC if requested by the applicant.

10.2.2 Major changes

10.2.2.1 A major change is a change that is not a minor change.

10.2.2.2 Major changes generally may not be approved under Subpart 21.M.¹⁷

10.2.2.3 Major changes that are not substantial changes may be approved via an STC.

10.3 Further classification

10.3.1 Substantial changes

10.3.1.1 A substantial change is one which is so extensive that a substantially complete investigation of compliance with the applicable type certification basis is required.

10.3.1.2 A substantially complete investigation of compliance is required when most of the existing substantiation is not applicable to the changed aircraft or aeronautical product.

10.3.1.3 Substantial changes may only be approved via a new TC.¹⁸

¹⁷ See regulation 21.410 and subsection 3.1.

¹⁸ See regulation 21.019.

10.3.2 Significant changes

10.3.2.1 A significant change is a change to the TC 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.

10.3.2.2 The significance of the change must be considered in the context of all previous relevant design changes and all related revisions to the certification specifications of the applicable airworthiness code.

10.3.2.3 Not all product level changes are significant changes.

10.3.2.4 Design changes 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 significant.

10.3.2.5 Significant changes may only be approved via an STC or an amended TC.

10.3.3 Not significant changes

10.3.3.1 Not significant changes are those changes where there is no change to the general configuration, no change to the principle of construction and the assumptions used for certification are still valid. Minor design changes are automatically considered not significant.

10.3.3.2 Major changes that are not significant changes may be considered for approval under Subpart 21.M after the submission of a Design Advice.

10.4 Reclassifying changes

10.4.1 It is understood that not all the certification substantiation data will be available to those persons/organisations classifying design changes. A qualitative judgement of the effects of the change will therefore be acceptable for the initial classification. The subsequent review of the design change may lead to it being re-classified, owing to early judgements being no longer valid.

10.4.2 A request to reclassify an initial design change classification may be submitted to CASA via a Design Advice. The Design Advice application should include the reasons why the classification should be changed and data to substantiate the request, for example, flight test data that shows the impact on aircraft performance.

11 Noise certification

11.1.1 Noise certification for individual aircraft is required before the aircraft can legally operate in Australian territory. If the STC would affect the existing noise certification, then revised noise certification will be required. The following paragraphs are only relevant if revised noise certification is required.

11.1.2 Aircraft noise is regulated through the *Air Navigation (Aircraft Noise) Regulations 1984*. Noise certification, or lack of such certification, has no legal impact on the STC approval. However, if an individual aircraft does not meet the Australian noise requirements it is illegal for that aircraft to operate in Australian territory, even though the aircraft may have a valid certificate of airworthiness.

11.1.3 In the event that a long-term noise certification cannot be granted at the time of the initial application, the Environment Monitoring Branch of Airservices Australia may, as an alternative, issue a 'Permission to Operate' under subregulation 9A(2) of the *Air Navigation (Aircraft Noise) Regulations 1984*. This may be issued on the basis of a limited duration or restricted route and could be aligned to the terms of the experimental certificate of the test aircraft.

11.1.4 For further information in relation to noise certification the applicant should contact the Manager of Environment Monitoring, Airservices Australia, GPO Box 211, Mascot 1460, NSW or email: noise.assessment@airservicesaustralia.com

Executive Manager
Standards Division

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