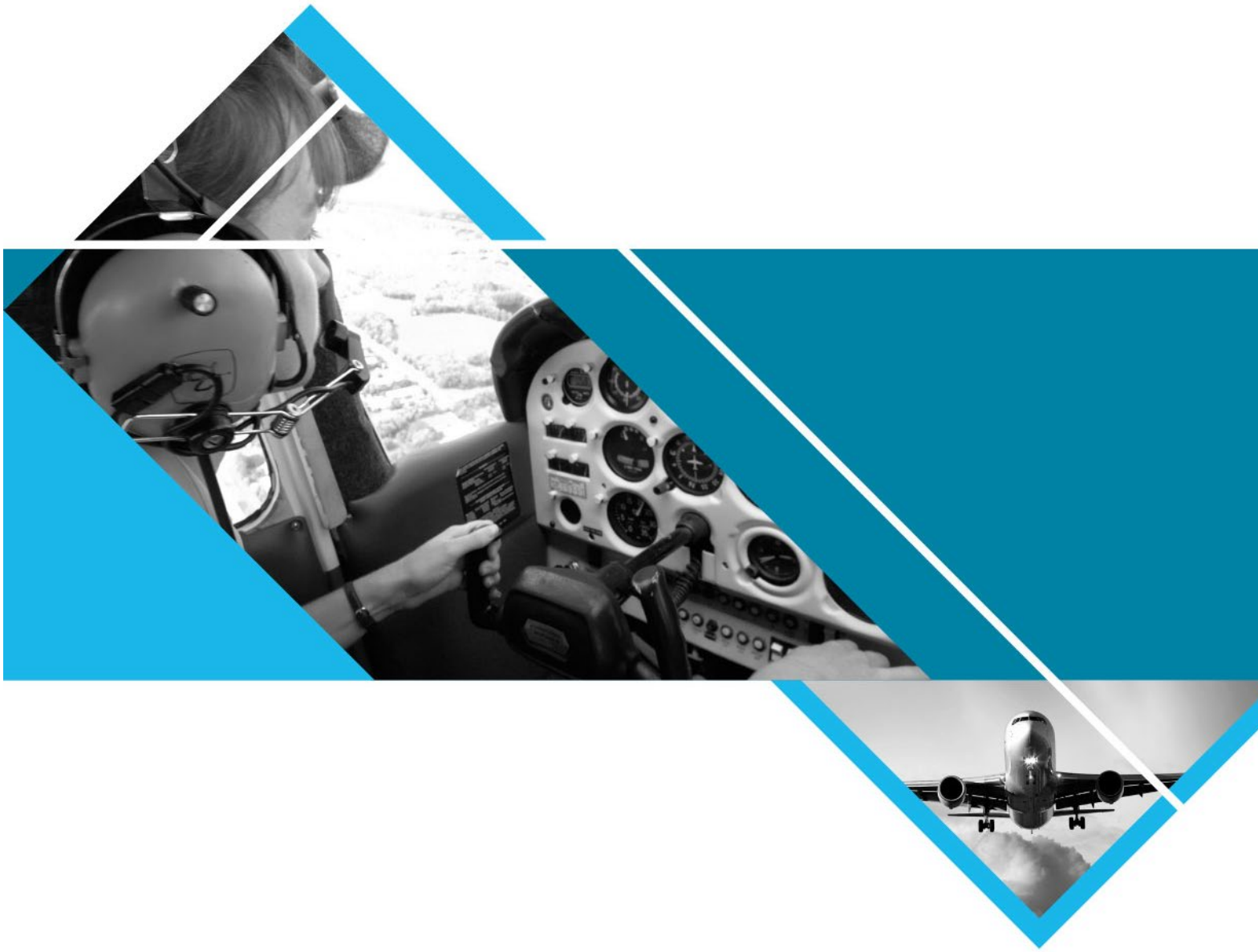
Australian Government
Civil Aviation Safety Authority



Production Authorisation Procedures Manual

Version	5.0 - March 2021
Approval Tier	Three
Owner	Branch Manager Airworthiness and Engineering
Responsible Area Manager	Manager Design and Manufacturing Oversight
Review Date	March 2024

This document becomes an uncontrolled document when printed. Refer to the <Document Catalogue> for current version.

This document contains guidance material intended to assist CASA officers, delegates and the aviation industry in understanding the operation of the aviation legislation. However, you should not rely on this document as a legal reference. Refer to the civil aviation legislation including the Civil Aviation Act 1988 (Cth), its related regulations and any other legislative instruments—to ascertain the requirements of, and the obligations imposed by or under, the law.

Preface

As a Commonwealth government authority, CASA must ensure that the decisions we make, and the processes by which we make them, are effective, efficient, fair, timely, transparent, properly documented and otherwise comply with the requirements of the law. At the same time, we are committed to ensuring that all of our actions are consistent with the principles reflected in our Regulatory Philosophy.

Most of the regulatory decisions CASA makes are such that conformity with authoritative policy and established procedures will lead to the achievement of these outcomes. Frequently, however, CASA decision-makers will encounter situations in which the strict application of policy may not be appropriate. In such cases, striking a proper balance between the need for consistency and a corresponding need for flexibility, the responsible exercise of discretion is required.

In conjunction with a clear understanding of the considerations mentioned above, and a thorough knowledge of the relevant provisions of the civil aviation legislation, adherence to the procedures described in this manual will help to guide and inform the decisions you make, with a view to better ensuring the achievement of optimal outcomes in the interest of safety and fairness alike.

Graeme Crawford
Acting Chief Executive Officer and
Director of Aviation Safety

Work health and safety (WHS) for employees.

All CASA workers (including contractors) have legal duties under the WHS legislation. Your duty as a worker includes taking reasonable care of your own health and safety and ensuring that nothing you do (or omit) causes harm to others. You must comply so far as reasonably practicable with any reasonable instruction given to you by CASA and you must co-operate with any reasonable WHS policy or procedure. Your duty of care is proportionate to the control you can exercise over your work activities and work environment.

Different roles in CASA bring different hazards which, if not managed effectively, may create a safety risk. For example, working airside, working outdoors, driving long distances, or dealing with client aggression.

The management of health and safety is integrated into how we conduct our daily work e.g. use of personal protective equipment, training and our work protocols. The WHS Risk Register and Safe Work Practices document identified risks and their management. However, if you identify something that poses an unacceptable risk, you should not place yourself or others at risk of injury; ensure that you discuss the risk with your supervisor as soon as practicable and (if necessary) report the hazard in ESS. Continuous improvement of our health and safety management system is essential to keeping everyone safe at work.

For further information go to the WHS Horace page or contact WHS@casa.gov.au.

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Glossary

Acronyms and abbreviations

Acronym / abbreviation	Description
A&EB	Airworthiness and Engineering Branch
AC	Advisory Circular
the Act	Civil Aviation Act 1988
AD	Airworthiness Directive
ADO	Approved Design Organisation
AP	Authorised Person
ARC	Authorised Release Certificate
CAD	Computer Aided Design
CAM	Computer Aided Manufacturing
CAR	Civil Aviation Regulations 1988
CASA	Civil Aviation Safety Authority
CASR	Civil Aviation Safety Regulations 1998
CNC	Computer Numeric Controlled
CVM	Conformity Verification Matrix
CVP	Conformity Verification Plan
ETSO	European Technical Standard Order
FIS	Fabrication Inspection System
ICA	Instructions for Continued Airworthiness
ICAO	International Civil Aviation Organization
IPC	Illustrated Parts Catalogues
MI	Manufacturing Inspector
MRB	Material Review Board
NAA	National Airworthiness Authority
NC	Numeric Controlled
SF	Safety Finding
NDI	Non-Destructive Inspection
OEM	Original Equipment Manufacturer
PA	Production Authorisation
PC	Production Certificate
PCB	Production Control Board

Acronym / abbreviation	Description
PI	Permissions Issue
PIS	Production Inspection System
RSO	Regservices Officer
SDR	Service Difficulty Report
SFR	Standard Form Recommendation
STC	Supplemental Type Certificate
TC	Type Certificate
TCB	Type Certificate Board

Definitions

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.
Australian Parts Manufacturer Approval (APMA)	It is a design and production approval document issued to the applicant by CASA. This would normally be accompanied by an APMA Supplement, which specifies the limit of design and production authorisation.
Appliance	Any instrument, mechanism, equipment, part, apparatus, appurtenance, or accessary, including communication equipment that is used or intended to be used in operating or controlling an aircraft in flight, is installed in or attached to the aircraft and is not part of an airframe, engine or propeller
Applicant	A person who applies to engage in an activity for which a Production Authorisation is required.
Aviation Reference Number (ARN)	A unique number issued by CASA to an industry participant.
Article	A part or component manufactured under an ATSOA for use on type certificated products.
Associate Facility	A facility that has been approved as an addition to an original production approval. The address must be listed in the Production Limitation Record or Australian Parts Manufacturer Approval Supplement.
Australian Technical Standard Order (ATSO)	A minimum performance standard issued by CASA for specified articles used on civil aircraft;
Australian Technical Standard Order Authorisation (ATSOA)	A CASA design and production authorisation issued to a specific manufacturer of an article which has been found to meet or exceed a specific Australian Technical Standard Order (ATSO), European Technical Standard Order (ETSO) or Technical Standard Order (TSO) performance standard. The ATSOA does not confer installation

Term	Definition
	authority. The installation of the article must be separately approved as part of the type design of a type certificated product.
Authorised Person	A person authorised under an Instrument of Authorisation to exercise a power in a specific provision of CASR or CAR where the term 'authorised person' appears. The authorisation is specific to the legislative provision.
Certificate Management	The ongoing audit function carried out by CASA following the issue of a production authorisation.
Critical	A term applicable to parts, appliances, characteristics, processes, maintenance procedures, or inspections which, if they fail, are omitted, or are non-conforming, may cause significantly degraded airworthiness of the product during take-off, flight, or landing.
Delegate	A person authorised under an Instrument of Delegation to exercise the power of a specific CASR or CAR.
Design Data	Consists of all drawings and specifications, which may be summarised on a master drawing list, that are necessary to show the configuration of the part, and all information on dimensions, tolerances, materials, processes, and procedures necessary to define all characteristics of a part as well as the Airworthiness Limitations Section of the Instructions for Continued Airworthiness. It also includes analysis, technical reports and other related data.
Production	Manufacture of aircraft, aircraft engines, propellers and parts, including control of materials and processes used in the manufacture.
Production Authorisation Holder (PAH)	The holder of a PC, APMA, ATSOA or other special manufacturing authorisation, who is responsible for conformity of the product or part to its product design and maintaining the approved quality system.
Production Limitation Record (PLR)	A schedule attached to, and forming part of a PC, that lists the limits of production authorised under the PC.
Project Officer	The CASA officer responsible for the coordination and management of the production authorisation application.
Quality System	A documented organisational structure containing responsibilities, procedures, processes, and resources that implement a management function to determine and enforce quality principles. It also denotes inspection systems in regard to the requirements of CASR 21.F, 21.G, 21.K and 21. O.
Special Process	A process where the results cannot be readily verified by subsequent inspection and testing, and where processing deficiencies may become apparent only after the product is in use. Such processes shall be carried out by qualified operators and require continuous monitoring and control of process parameters to ensure that the specified design requirements are met.
Standard Part	A part that complies with a specification that: (a) is established, published and maintained by:

Term	Definition
	(i) an organisation that sets consensus standards for products; or (ii) a government agency; and (b) includes: (i) design, manufacturing, test and acceptance criteria; and (ii) requirements for the uniform identification of the part.
Supplier	Any person who furnishes parts or related services (at any tier) to the production authorisation holder manufacturing an aeronautical product or part.

References

Regulations

Document	Title	Application
Section 11 of the Civil Aviation Act 1988 (the Act)	Functions to be performed in accordance with international agreements	Australia, as a contracting state to ICAO, has an obligation to ensure that functions carried out in Australia are performed in accordance with international agreements. Section 11 of the Act refers. The Civil Aviation Regulations 1988 (CAR) and CASR Part 21 are consistent with the provisions of the Act.
Section 31 of the Act	Review of decisions	Section 31 of the Act makes all decisions to refuse to grant, vary, suspend or cancel an authorisation reviewable by the AAT.
Section 97 of the Act	Payment of prescribed fees	If a fee is prescribed for the grant of an authorisation, then the authorisation need not be granted until the fee is paid.
Civil Aviation (Fees) Regulations 1995		Fees for aviation regulatory services.
Part 1 of the Civil Aviation Safety Regulations 1998 (CASR)	Preliminary	Describes legislative links to other aviation legislation and practices.
Part 11 of CASR	Regulatory administrative procedures	Describes regulatory administrative procedures.
Subpart 21.A of CASR	Certification and airworthiness requirements for aircraft and parts - General	Defines the applicability of CASR Part 21, including provisions dealing with falsification of applications, suspension and cancellation actions and reporting of failures by PA holders.
Subpart 21.F of CASR	Production under type certificate only	Prescribes the requirements for of production under a TC only. It contains the requirements for establishing a Production Inspection System (PIS) and a Materials Review Board (MRB). This method of production does not provide the same degree of flexibility as a PC.

Document	Title	Application
Subpart 21.G of CASR	Production certificates	Prescribes the requirements for issue of a PC and the rules governing the production of aircraft, aircraft engines and propellers and certain parts.
Subpart 21.K of CASR	Approval of materials, parts, processes and appliances	Prescribes the requirements for issue of an APMA. This authorisation is a design, production and installation approval.
Subpart 21.O of CASR	Australian Technical Standard Order Authorisations	Prescribes the requirements for issue of an ATSOA. This authorisation is both a design and PA.
Subpart 21.Q of CASR	Identification of aircraft and aeronautical products	Prescribes the requirements for part identification and marking.
Part 201 of CASR	Miscellaneous	Prescribes the appointment of Authorised Persons (AP). Part 201.004 makes appealable any condition imposed on an approval, authorisation, authority, certificate or permit.

Forms

Form no.	Title
Form 001	Authorised Release Certificate
Form 001i	Authorised Release Certificate - Instructions for completion by the originator
Form 316	Standard Form Recommendation
Form 724	Statement of Conformity
Form 786	Manufacturing - Request for A&EB Services
Form 787	Manufacturing Approval Desktop Review
Form 789	Process Approval Letter Template
Form 790	APMA Cover Letter Template
Form 791	APMA Supplement Template
Form 792	ATSOA Letter Template
Form 793	One-off PC Cover Letter Template
Form 794	One-Off PC Template
Form 795	One-Off PC PLR Template
Form 798	PC Cover Letter Template
Form 800	PC PLR Template
Form 801	PC Template
Form 802	Process Approval Supplement
Form 849	Production Approval - Application
Form 882	Conformity Inspection Record

Revision history

Revisions to this manual are recorded below in order of most recent first.

Version no.	Date	Parts / sections	Details
5.0	March 2021	All	Review and update of complete manual
4.1	October 2017	5.2.1	Add Conformity Timeframes
4.0	August 2017	All	Reformatted into new template. Position details updated.
3.0	July 2011	All	Review and update of manual.
2.1	March 2001	All	Update to reflect CASA organisational changes - transfer of the Manufacturing Branch from the Standards Development and Future Technologies Branch to the Operations Division. Introduced the concept of a Technical Sponsor, responsible for the integrity of the technical content of this manual.
2.0	August 2004	All	Updated to reflect Part 21 of CASR regulations
1.0	May 2000	All	First issue

1 Background

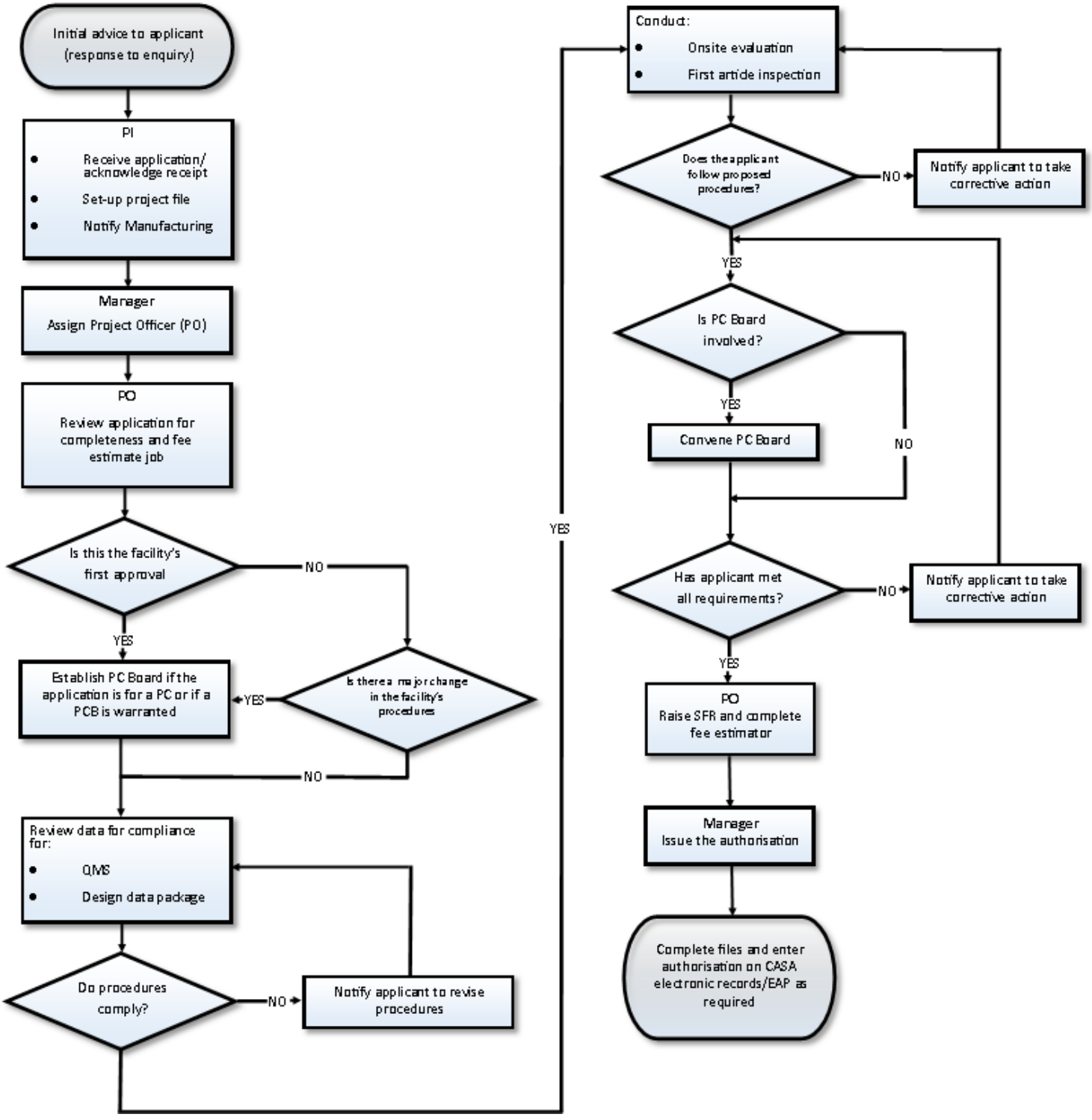
The purpose of this manual is to provide CASA staff with procedures for assessing applications for Production Authorisations (PAs) under Part 21 of the Civil Aviation Safety Regulations 1998 (CASR) and for issuing those authorisations.

This manual covers a range of subject matter relating to PAs. This includes, but is not limited to the following:

- Production under Type Certificate only (TC) under Subpart 21.F of CASR
- Production Certificate (PC) under Subpart 21.G of CASR
- Australian Parts Manufacturer Approval (APMA) under Subpart 21.K of CASR
- Australian Technical Standard Order Authorisation (ATSOA) under Subpart 21.O of CASR
- other approvals approved under Subpart 21.K of CASR.

The Manager appoints a CASA Project Officer (PO) for a particular production authorisation, who ensures that the production authorisation application is assessed effectively and that all aspects of the authorisation are complete and in accordance with this manual. When satisfied, the PO recommends the issue of the authorisation to the Delegate.

2 Production Authorisation Process



2.1 General

2.1.1 Advice for general enquiries

When people make enquiries about PAs, CASA staff will provide them with relevant advice and direct them to read the appropriate Advisory Circular (AC) for the particular authorisation, including:

- AC 21-14 Production Certificates
- AC 21-16 Australian Parts Manufacturer Approval Process
- AC 21-20 Production Under Type Certificate Only
- AC 21-27 Manufacturing Approval — Overview
- AC 21-54 Australian Technical Standards Order Authorisation

Should the person wish to proceed, they will need to submit a formal written application (Form 849) to CASA before the application can be processed. Enquirers must be advised that cost recovery procedures are applicable.

Regardless of which PA is sought, it is the applicant's responsibility to demonstrate conforming products and parts. It is CASA's responsibility to find that conforming parts have been demonstrated as a basis for issue of the authorisation sought. A non-conformed proof-of-concept product is not a basis for CASA assessment and subsequent approval.

The CASA officer should advise the applicant of the advantages of obtaining a PC. The advantages of being a PC holder, compared to production under a TC only, include the following:

- no requirement to submit Form 724 to CASA, for each conformed product
- reduced CASA involvement, relative to conformity inspections
- an Authorised Person within the approved Production Inspection System (PIS) will be able to issue airworthiness certificates and approvals for completed products without reliance on CASA inspections
- the issue of export approvals for small aircraft without assembly or flight test (in accordance with regulation 21.325 of CASR).

Administrative processing of an application

Administrative procedures by Permissions Issue (PI)

1. All PA applications are received by PI on Form 849. The job gets allocated to manufacturing to provide an estimate of hours and check relevant documents have been provided, once all relevant data has been received, PI will send a draft cost estimate to Manager for completion.
2. Once the applicant has paid the required fees, PI will create a task that is assigned to the Manager. Once the task is accepted by the Manager, PI manages the application as required, in accordance with their procedures.
3. When the task is completed, the Manager or the appointed PO will advise PI of completion and will provide the actual hours spent on the job.
4. PI will advise the applicant of the actual cost and recover additional cost or provide a reimbursement to the applicant.

2.1.2 Technical processing of an application

Manager - Design and Manufacturing Oversight

1. The Manager monitors the progress of the application. If it becomes evident that the application will not be processed within the normal timeframe, he will ensure that the applicant is notified accordingly.
2. The Manager appoints a PO for each task and updates the job management system to reflect the appointed PO.
3. The Manager is the design approval authority for design submitted in support of PA except for design for Type Certificate (TC), Supplementary Type Certificate (STC) and One-off PC.

Project Officer (PO)

1. Inserts the estimated hours and completion dates in the work flow management system (RAPS and Regulatory Fees Estimator) and accepts the task for Manufacturing Section.
2. Checks that Form 849 is complete and on the document management system
3. Checks available information for any current enforcement actions pending or proceeding in relation to the applicant or whether any exclusion periods have been imposed. Refer any of these to the Legal, Regulatory Policy and International Strategy Branch (LARPIS) for advice, if needed.
4. Plans and conducts Pre- and Post-PCB meetings. If a Production Control Board (PCB) is required, pre-PCB (CASA) and post-PCB (applicant) meetings must be convened (refer to section 2.2), to prepare both CASA officers involved in the assessment and the applicant for the requirements of the assessment. The activities are to be completed in accordance with Figure 1.

Note: A PCB is required for Class 1 items, and may be required for other items, depending upon the complexity and investigations required.

5. If the application does not require the establishment of a PCB, proceed as for the preliminary assessment only.
6. Raises a Standard Form Recommendation (SFR) as per Appendix D to the CASA Delegate recommending or not recommending the issue of the PA.
7. The SFR is to be placed in the appropriate document management system.

Regservices Officer (RSO)

1. On application of a new task from PI, the RSO is to advise Manager and assist Manager or the PO with the development of the cost estimate.
2. On task completion, the RSO assists Manager or the PO with the final cost assessment and provide such to PI.
3. The RSO acts as the PCB secretariat for document management and distribution.
4. Once Manager or the POs have issued the finalised permissions, the RSO enters the permissions and their relevant data in the document management system.
5. The RSO assists in closing the task in the document management system in consultation with the PO's.

2.2 Production Control Board (PCB)

A PCB is a CASA panel established for the purpose of facilitating the assessment of a PA.

PCBs should be convened for initial PAs covered by production under TC only or PC, or when entire facilities have been relocated or are to be added to the PA. PCBs would generally not be convened for the addition of new models to the PA or for relocation of a portion of a facility, unless significant changes in production technology or processes apply. In these instances, follow the procedures in Chapter 3 - Assessment and Issue of Authorisations.

A PCB may be convened for any type of PA application at the discretion of the PO when deemed necessary.

2.2.1 PCB membership

The PCB will be chaired by Manager and will include the PO. A member from CASA certification and any other nominated specialists may also be included, if required.

These members will assist in evaluating the applicant's production, engineering, flight test procedures, and other related functions. In extenuating circumstances, the PO may be required to act as the Chairperson of the PCB and will coordinate activity through the Manager.

2.2.2 PCB member responsibilities

The PCB chairperson is responsible for:

- assigning board members, as deemed appropriate for the particular product, and notifying members of the pending PCB schedule in sufficient time to permit adequate planning and preparation
- notifying the applicant of the PCB schedule and agenda
- selecting a representative number of the applicant's supplier facilities for evaluation to determine whether or not the applicant's quality system provides for satisfactory supplier control
- conducting pre/post-PCB meetings with CASA officers and/or the applicant
- documenting action items and allocating corrective action responsibilities for CASA and the applicant as agreed at the PCB meeting
- reviewing and analysing the PCB findings and ensuring that appropriate corrective actions have been or will be taken by CASA and the applicant
- completing, signing, and distributing the PCB minutes and action items.

Project Officer

The PO is responsible, using administrative assistance as appropriate, for:

- establishing schedules
- making arrangements for meeting rooms
- obtaining sufficient copies of quality system data
- making all other arrangements necessary for convening and conducting the PCB in the most expeditious manner
- ensuring that all agreed-upon corrective actions have been taken by the applicant
- preparing the minutes and action items resulting from the PCB.

Specialists Members

Specialist members will be assigned responsibilities to:

- provide specialist support regarding the design data in relation to the application at the PCB. Provide specialist input regarding the applicant's production engine/propeller test procedures, as required by paragraph 21.143 (1), subregulation 21.127, 21.128 or 21.129 of CASR
- provide specialist input regarding the applicant's flight test procedures and check-off lists as required by paragraph 21.143 (1A) (c) of CASR
- report and recommend to the PO (rather than making direct communication with the applicant) depending on the communication protocols established at the PCB.

2.2.3 Conduct of the PCB

A PCB is generally conducted as follows:

- Initial CASA planning meeting
- Pre-PCB meeting
- PCB assessment of applications
- PCB meetings
- Final phase of PCB
- PCB conclusion.

Initial CASA planning meeting

A meeting of CASA personnel is held to plan the preliminary assessment and related correspondence between CASA and the applicant. This meeting is also used to plan the PCB schedule for subsequent meetings; and establish agenda items for the pre-PCB meetings.

Pre PCB meeting

A Pre-PCB meeting may be held with the applicant's representatives upon receipt of the PA application. This meeting should include the Chairperson and any other specialist as necessary. The purpose of this meeting is to advise the applicant of the purpose of the CASA PCB and of CASA's evaluation plans.

This meeting is for CASA to inform the applicant that the PCB is a fact-finding body convened to determine whether or not the applicant is in compliance with the applicable Subparts 21. F, G, K and O of CASR. In making this determination, the PCB will thoroughly evaluate the applicant’s quality system, data, organisation and production facilities including suppliers. It is at this point that the Chairperson determines whether or not the location of the applicant’s facilities poses an undue burden on CASA, as specified in regulation 21.137, 21.601(4) or 21.303 (10) of CASR.

PCB assessment of applications

Following the pre-PCB meeting with the applicant, the PCB evaluates the applicant's quality system data and performs an on-site evaluation of the applicant's quality system, organisation, production facility and suppliers, as appropriate.

PCB meetings

PCB meetings are conducted as needed to discuss and evaluate each unsatisfactory condition and related recommendation submitted by each member. All unsatisfactory conditions are recorded as findings. A final meeting, attended by all PCB members and representatives of the applicant, is held to advise the applicant of the PCB findings. Each unsatisfactory condition and recommendation should be presented and briefly discussed.

Corrective action

The PCB must request that the applicant commence immediate corrective action on those items that directly involve the product and related quality practices. A reasonable time may be allowed for correcting deficiencies in the quality system data. However, the applicant must be advised that the PCB cannot recommend that an approval be issued until all applicable regulations are complied with and all corrective actions addressed to the satisfaction of the Manager.

Formal confirmation

The applicant must also be advised that they will receive an official letter confirming the verbal presentation of the list of unsatisfactory conditions and recommendations. This formal notification should be prepared and signed by the PCB Chairperson, within ten working days of the final meeting with the manufacturer.

Violations

If the applicant is manufacturing a product under a TC only, and any of the unsatisfactory conditions are determined to be violations of CASR Subpart 21.F, the coordinated enforcement process (see CASA Enforcement Manual) should be initiated by the Manufacturing Section.

Final phase of the PCB

The final phase of a PCB is the evaluation by the Manufacturing Section of the corrective action taken by the applicant. The results of any re-inspection should be reported to the Chairperson of the PCB and, if satisfied, the PO will recommend approval to the CASA Delegate on an SFR.

PCB conclusion

If compliance with the required provisions of the CASR is demonstrated, upon guidance from the Manager, PI will formally advise the applicant in writing, as soon as practicable that an authorisation will be issued. Conversely, if compliance has not been demonstrated, the applicant will be formally advised that an approval will not be issued, and a statement of reasons must be advised to the applicant.

2.2.4 PCB records

The RSO in consultation with the PO shall prepare the PCB minutes and action items for the signature of the Chairperson and the applicant point of contact. The minutes should contain a concise record of the entire PCB proceedings, including the names and titles of all participants. All correspondence and forms relating to the PCB are considered to be part of the minutes and should be attached as appendices.

Once accepted by the Chairman, the PCB minutes should be distributed as follows:

- original applicant's document saved into the management system file
- one copy sent to the applicant.

The RSO will advise all members of the PCB as correspondence is generated and stored in the document management system.

2.2.5 Administration of PAs granted

ARNs

All PA numbers state the ARN of the organisation.

PC numbers

A PC's number consists of the letters PC- followed by the ARN of the applicant—for example, PC-123456. It is unlikely that there would be more than one PC issued to an organisation because the production limitation record (PLR) can list multiple products, activities and locations.

An approval issued under subregulation 21.133 (2B) of CASR uses the letters PC - followed by the ARN of the applicant followed by -1, for example PC-123456-1.

APMA numbers

Only one APMA is likely to be issued to an organisation. An APMA number consists of the letters APMA - followed by the ARN of the applicant—for example, APMA-123456. The specific aeronautical products and parts are listed on the supplement; an additional APMA supplement is issued to add new products. The first and any additional supplements are numbered consecutively from 001.

ATSOA identification

An ATSOA is expected to be a discrete issue, and an organisation is likely to have multiple ATSOA approvals. The Letter of Approval identifies the specific item(s). The applicant's ARN will be quoted in the letter. ATSOA number should be ATSOA-(ATSO/TSO/ European Technical Standard Order [ETSO] Number)-(ARN of Organisation) for example: ATSOA-C1001-12345.

Process approval identification

If a Process Approval is granted under subregulation 21.305 (e) of CASR for a material, part, process or appliance the numbering should consist of PA and the ARN of the applicant. For example: PA-12345. Activities approved under the PA are listed on the PA Supplement (Form 802).

Document management system

The RSO is responsible to update the document management system as new permissions or variations are issued as a project closure activity.

3 Assessment and issue of authorisations

3.1 Production under Type Certificate

3.1.1 Applicability – production under type certificate only

This section provides guidance on the production of an aircraft, aircraft engine or propeller under a TC only, prior to obtaining a PC.

For production under a TC only, the manufacturer must comply with Subpart 21.F of CASR, including establishing and maintaining an approved Production Inspection System (PIS)

Note: Additional guidance is contained in AC 21.20 and AC 21.27.

CASA considers that an approved PIS supports only an interim production stage, and they should be encouraged to achieve a PC for their activities.

Additionally, as CASA provides the resources on a cost recovery basis to determine whether the product and parts manufactured by the applicant conform to the type design, and are in a condition for safe operation until a PIS is established, the cost of production under a TC only could be significant.

The regulations require the approved PIS holder to have process specifications, materials review records, test procedures and flight check forms that are acceptable to CASA and the applicant should have started developing these data concurrently with other data relevant to type certification requirements.

3.1.2 Responsibility

Subsequent to the date of issue of the TC and prior to the issue of a PC, CASA has full responsibility for determining whether the product and parts thereof conform to the type design and are in a condition for safe operation.

The PO is responsible for managing all aspects of progression to an approved PIS and for the relevant surveillance activities before and after the approved PIS is established.

3.1.3 Procedure for PIS issue

Preliminary assessment procedures

An TC holder or licensee seeking an approved PIS must show compliance with regulation 21.123 of CASR. The assessment of the approved PIS is similar to the assessment of the PIS for a Production Certificate in accordance with regulation 21.144 of CASR.

This preliminary assessment consists of an evaluation of the applicant's PIS, facilities, equipment, processes, personnel, control of suppliers, stores etc. to ensure that they are adequate for the purpose. As part of the establishment of the PIS, the manufacturer is required to submit a manual that describes the system and the means of making the determinations in accordance with 21.125(2) of CASR.

The PO must evaluate the adequacy of the quality system by personally observing the control of each stage of production of detail parts, sub-assemblies and completed products, and all supporting functions such as document control.

In the preliminary assessment, the appropriate sections of this manual are used to assess:

- suppliers
- supplier control
- all quality systems.

Project Officer

The PO:

- makes arrangements to conduct the preliminary assessment only after the applicant has accepted the CASA estimate of costs, made the required advance payment and has the capability to comply with the regulatory requirements
- conducts desk top review of the manufacturer's data (including any referenced procedures, policies, standards, instructions, processes) which describe the quality system
- assesses the applicant's quality system assisted by specialists, as required
- carries out the assessment concurrently with conformity inspections of first articles prior to approving the PIS to ensure the applicant's PIS is adequate on a progressive basis
- as parts of the PIS are found to meet the regulatory requirements:
  - the PO records on an SFR the portions of the system considered satisfactory for consideration and acceptance at the approved PCB. Acceptance of the SFR should be documented in the approved PCB minutes
  - they may be approved by CASA on a progressive basis. When areas are found compliant, CASA may reduce inspection and increase reliance upon the manufacturer's PIS. This does not absolve CASA from the responsibility of carrying out inspections and being satisfied before issuing airworthiness approvals for the product.
  - places increasing emphasis on securing corrective actions on the parts of the system where procedural discrepancies or nonconformities are found, or where the system is found to be inadequate.

Assessing the TC holder or licensee's progress

Any TC holder or licensee seeking to manufacture under a TC will have only 6 months from the date of issue of the TC to establish and implement an approved PIS in accordance with regulation 21.123 of CASR. During this 6 month period CASA has full responsibility for determining whether the product and parts thereof conform to the type design and are in a condition for safe operation. A manufacturer may, however, apply for an extension of time to complete, have approved and implement a PIS when there are unusual or extenuating circumstances that prevent the establishment of such a system within the allowed timeframe.

An approved PIS does not absolve CASA from the responsibility of carrying out inspections and being satisfied before issuing airworthiness approvals for the product, but it would be expected that with the issue by the manufacturer of the Statement of Conformity (CASR 21.130), the depth and intensity of such inspections would be reduced except where the inspection was associated with the actual surveillance of the approved PIS.

The PO will:

- periodically assesses the applicant's progress in obtaining approval of the PIS

- advise the applicant in writing of all known deficiencies if it appears that the applicant may not be eligible for approval of the PIS by the deadline date (six-month period as specified in paragraph 21.123 (1) (c) of CASR). The PO also cautions the applicant that after the deadline date, CASA will not issue any airworthiness certificates or any other approvals unless an extension of the time period is authorised by the delegate and keeps the delegate informed if such a situation becomes inevitable.

Extensions

Extension of six-month period: An application for extension of the six-month period, must take into consideration the impact the extension would have on CASA staff, resources and safety.

Subregulation 21.123 (3) of CASR allows CASA to grant an extension when there are unusual or extenuating circumstances that would preclude the approval of the PIS within the six-month limitation.

When an extension is to be granted, the applicant forwards requests for extension, together with a detailed summary of the inspections and assessment results during the six-month period, to the delegate. This should be detailed in an SFR.

Failure to establish a PIS

When an applicant fails to establish a PIS by the end of the six-month period (except as otherwise extended as above), CASA will no longer make conformity determinations and will discontinue all inspections. CASA will not issue airworthiness certifications and approvals.

Notifying the TC holder or licensee

On completion of the preliminary evaluation, the PO is to formally notify the applicant of any corrective actions needed. In so doing, the PO is to advise the applicant that these items only represent CASA's preliminary findings and that additional requests for corrective actions can be anticipated as a result of subsequent findings by the PCB, future routine surveillance activities.

3.1.4 PIS Approval

Preparation and delivery of the letter approving the PIS

When the PCB has determined and documented that the manufacturer's complete PIS complies with Part 21 of CASR, the PO will prepare an SFR and a letter of approval for the signature of the delegate.

Note: When production under TC only is based on a licensing agreement for a specific period of time, the same period of time must be indicated on the PIS approval letter as a limitation to the approval.

Revision of a PIS approval letter

Subsequent to the issue of the original letter, the manufacturer may apply to add another type-certificated product or a new model to the manufacturer's PIS. The Manager must appoint a PO to evaluate any required changes to the PIS resulting from new technology, change to the facilities and staff.

Project Officer

If the change is considered to be significant, the Manager may re-convene the PCB to make the determination and process the application in accordance with this section.

If a PCB is not required, a PO may carry out an assessment, provide an SFR and draft the revised letter for the delegate. The draft letter is to refer to the original approval letter.

The PO will then issue the new letter, withdraw the obsolete letter, and file all correspondence.

3.1.5 TC holder's / TC licencee's responsibility under Subpart 21.F

In accordance with regulation 21.130 of CASR, manufacturers producing aircraft, aircraft engines or propellers under a TC only (under Subpart 21.F of CASR) are required to submit to CASA a Statement of Conformity (Form 724) for each completed aircraft, aircraft engine or propeller. The Statement of Conformity is required before aircraft produced only under a TC can be issued with a Certificate of Airworthiness or, in the case of engines and propellers, before an Authorised Release Certificate (ARC) can be issued. The Statement of Conformity submitted by the manufacturer is a certification that the product conforms to its type design and is in a condition for safe operation.

Subsequent to the issue of a PIS, the TC holder/licencee is additionally responsible for maintaining the PIS in accordance with regulation 21.125 of CASR to ensure that each product conforms to the type design and is in a condition for safe operation. The manufacturer must also comply with any terms or conditions as prescribed in the PIS approval letter. A TC holder/licensee is responsible for reporting any failures, malfunctions, and defects as required by regulation 21.003 of CASR.

Note: The manufacturer must report serious occurrences that have occurred to CASA, as listed in subregulation 21.003 (4) of CASR.

The manufacturer does not need to report to CASA things as listed in subregulation 21.003 (4) of CASR that might occur unless the product has left its premises.

Normal manufacturing problems can be fixed and not reported to CASA if the product has not left the manufacturer's control or can be readily retrieved.

Products manufactured under the provisions of Subpart 21.F of CASR must be marked in accordance with the requirements of Subpart 21.Q.

Testing (aircraft, engines, propellers)

Each person who produces a completed product (except rocket engines) under Subpart 21.F of CASR must flight test and/or functional test that product.

- **Aircraft**: Each aircraft produced under Subpart 21.F, both prior to and subsequent to the issue of a PIS, must be flight-tested in accordance with regulation 21.127 of CASR.
- **Engines and propellers**: Each engine or propeller produced under Subpart 21.F of CASR, both prior to and subsequent to the issue of a PIS, must be subjected to an acceptable test run or functional test in accordance with the requirements of regulations 21.128 or 21.129 of CASR, as appropriate.

3.1.6 PIS holder's facility location

A PIS holder's manufacturing complex may consist of a principal facility and associate facilities using the same quality system approved by CASA for the particular type certificated product(s).

The principal facility and associate facility addresses are listed on the PIS. A post office box address is not acceptable for a facility because the actual location must be identified. However, post office boxes may be used as postal addresses for correspondence.

When a PIS holder moves the principal manufacturing facility to a new location the PIS is no longer effective.

CASA Manufacturing must be notified of the changes when the PIS holder moves an associate facility or adds a new plant. If the change is significant, before the new plant or moved facility is approved for production it must be subjected to a satisfactory audit or be assessed by a PCB. The PIS must be amended to reflect this change.

3.1.7 Assessment of an TC holder or licensee's suppliers

See subsection 4.1.1 for supplier evaluation procedures.

3.2 Production Certificates

3.2.1 Applicability – Production Certificate

This section provides guidance on the assessment and issue of a PC when an applicant complies with Subpart 21.G.

Note: Additional guidance is contained in AC 21.14 and AC 21.27.

The following persons may apply for a production certificate (refer to regulation 21.133 of CASR for details):

- the holder or licensee of a current Australian TC or foreign TC
- the holder or licensee of a current Australian STC or foreign STC
- a person who has an agreement with a foreign manufacturer to manufacture a product for supply to the foreign manufacturer, when the terms of agreement require the person to be approved by CASA to manufacture the product
- a person lawfully manufacturing, or proposing to manufacture, aircraft components for which a certificate of type approval is in force
- a person engaged in manufacture of Class II or Class III products, on a one-off basis, for supply to:
  - the holder of a certificate of approval engaged in the maintenance of an aircraft for installation in or on the aircraft; or
  - the owner or operator of an aircraft for installation in or on the aircraft/aeronautical product. Modification parts for an STC can be manufactured under either a production certificate or an APMA. STC holders who only intend to produce STC modification parts should be advised to apply for an APMA.

3.2.2 One-off PC

This authorisation has been introduced to assist industry in obtaining aeronautical products, required as part of the maintenance of an aircraft, from other organisations qualified to manufacture those products. A PC for this purpose may be issued under subregulation 21.133 (2B) of CASR.

The approval is limited to the manufacture of Class II or Class III product on a 'one-off' basis for supply to the:

- holder of a Certificate of Approval engaged in the maintenance of an aircraft for installation in or on the aircraft
- the owner of an aircraft or the operator of an aircraft for the installation in or on the aircraft, engine or propeller.

A PC issued under subregulation 21.133 (2B) of CASR can be issued in accordance with the procedures in this manual, with the following limitation entered on the PLR section:

Limited to the manufacture and supply of parts to:

- a maintenance organisation
- an owner/operator of the aircraft, aircraft engine or propeller.

The requirements on the One-Off PC holder are the same as those requirements for any PC holder, other than an MRB process is not mandatory. All parts manufactured must conform to the product design and be in a condition for safe operation.

3.2.3 Production limitation record (PLR)

Each production certificate includes, or has attached to it, a PLR. The PLR is the means for listing the products that a production certificate holder is authorised to manufacture under the production certificate. A production certificate may not authorise production of every model listed on a TC. Therefore, for a Class I product, CASA will list on the PLR the specific models included in the TC that are authorised for manufacture under the production certificate and the date of such authorisation.

A PLR for a one-off production certificate describes the type of parts authorised for manufacture under the production certificate.

The PLR may include generic descriptions (e.g. for cables and hoses), by material specification, length and fittings. Subregulation 21.151 (c) of CASR requires the PLR to set out, for a Class II or Class III product referred to in subregulation 21.133 (2B)—a description of each product authorised to be manufactured under the production certificate. However, specific replacement parts for general sale are required to be manufactured under an APMA or ATSOA.

Note: The use of an Authorised Release Certificate (Form 001) for a one-off PC is described in section 4.1.10.

3.2.4 Responsibility for PCs

- the PO is responsible for managing all aspects of an application for a PC
- the Manager is responsible for ongoing certificate management.

Advising the applicant

The PO is to advise the applicant on the data required to be submitted. As part of the assessment, CASA must ensure that the PC applicant understands that the holder of a PC is responsible for:

- maintaining the quality system in accordance with the regulations, data and procedures approved for the PC

Note: CASA does not accept the registration and certification of quality systems by third parties as compliance with CASR Part 21 requirements, and will make an independent assessment of such systems as part of the entry control process for the issue of a PA. However, a quality system based on SAE AS9100 forms a sound foundation for a quality management system that, if properly implemented, should address some of the Part 21 quality system requirements.

- ensuring conformity with the Type Design or Product Design, as applicable, and condition for safe operation of each completed product or part
- notifying CASA in writing of any changes to the quality system that may affect the inspection, conformity, or airworthiness of the product or part in accordance with regulation 21.147 of CASR. These changes include:
  - relocation of a part of a facility or addition to existing facilities
  - introduction of overseas manufacturing facilities and overseas suppliers
  - discontinuing production for an extended period of time for other than normal reasons such as scheduled holidays
  - resumption of production after discontinuance
  - significant curtailment/resumption of production operations
  - significant reduction/reassignment of quality system personnel
  - changes or revisions to quality system data and related procedures.
- marking products in accordance with Subpart 21.Q of CASR and approved design data
- reporting all failures, malfunctions, and defects as required by regulation 21.003 of CASR.

3.2.5 Assessment procedures

The PA application (Form 849) is recorded by PI in accordance with CASA procedures.

Permissions Issue:

1. On receipt of the application, issue a letter of acknowledgment.
2. Provide a draft estimate for review and approval by Manager. PI is also to advise the applicant that CASA cannot proceed with the assessment until payment/acceptance, in writing, of the estimate of costs.

Preliminary assessment

The Manager

Upon receipt of a notification of a new application or a variation to an application from PI, the Manager will:

1. Assign a PO to the task to:

a. Provide input to the cost estimates.

b. Provide input on completion dates of the various phases of the application, namely documentation evaluation, inspection and tests, and certification processes.

2. Approve the estimate of hours using CASA estimator.

PO will

- complete estimate of hours as required by the Manager
- enter completion dates in the job management system when the task is assigned
- plan for the establishment of the PCB and a pre-PCB meeting with the applicant so that the meetings can proceed on payment/acceptance of the estimate of costs
- convene a pre-PCB meeting, before the preliminary assessment, if necessary.
- make arrangements to commence the preliminary assessment (after acceptance of the estimate of costs). This assessment consists of an evaluation of the applicant's quality system data, facilities, equipment, processes, personnel, control of suppliers, stores, etc, to ensure that they are adequate for the purpose.
- advise the applicant that a title must be provided for the quality system manual for positive identification. In addition, a revision page or similar control is required to ensure that the original approval date and the date of each revision are recorded. A number or letter, and date of the revision must identify each revision.
- for a new applicant, the assessment of the quality system data may require several visits to the applicant's facilities and suppliers as necessary, to evaluate and confirm that the procedures are in fact adequate to control the conformity of detail parts, sub-assemblies and completed products. The adequacy of the quality system must be physically evaluated by observing the control of each stage of production and all supporting functions.

Note: Where an applicant has existing quality control procedures for other purposes, the applicant must identify those parts that comprise the quality system that show compliance with CASR 21.143.

Establishing the PCB meetings

The PO is to establish the PCB and call PCB meetings, as appropriate, in accordance with the procedures in section 2.2.

Design data approval

The PCB is to determine the adequacy of the design data submitted by the applicant and provide confirmation, via the meeting minutes, that the design data is approved for the purposes of processing a production authorisation and issuing a PC.

Where a PCB is not required, the PO is to record the adequacy of the design data following the guidance provided. The CASA delegate will be the final approver of the design data.

Notifying the applicant

On completion of the preliminary assessment, the applicant is to be notified of any corrective actions needed. The applicant is also to be advised that these action items only represent CASA's preliminary findings and that additional requests for corrective actions can be anticipated as a result of subsequent findings of the PCB, and future surveillance activities.

3.2.6 Issuing the PC and PLR

For a full production certificate the PC and PLR certificates are prepared using the CASA templates for the:

- PC Cover Letter (Form 798)
- PC (Form 801)
- PLR (Form 800).

For a one-off Production Certificate the documents are prepared using the CASA templates for the:

- One-off PC Cover Letter (Form 793)
- One-off PC (Form 794)
- One-off PC PLR (Form 795).

Release of PC and PLR

When the PCB has determined and documented that the manufacturer's application has satisfied all the requirements of Part 21 of CASR, an SFR, the PC and PLR, and a draft cover letter of authorisation are prepared by the PO for the signature of the appropriate delegate.

The original PC and PLR are given to the applicant. Copies of the PC and PLR are kept on the applicable RMS file and on the master folders of PCs and PLRs issued or amended.

When preparing the PLR, list:

- the TC number or design data reference of each product authorised for production
- the model numbers and the date on which production was authorised
- any limitations (e.g. limitation to parts only).

Note: When a PC is issued and based on a licensing agreement for a specific period of time, the PC must terminate on the same date. The authorisation letter to the applicant must refer to this date.

Once the PC, PLR and Cover Letter have been approved, the PO will reconcile costs using the CASA estimator and submit to PI.

The RSO will:

1. Forward the original documents to PI for on forwarding to applicant and to close the job.
2. Update document management system with the permissions/certificate issued.
3. Update surveillance schedule, as required.

Additions to the PLR

If a PC holder wants to add a new product to the PC, (a new model or new parts), the holder must apply in the same manner as for the original issue.

When a PCB is not required, Manufacturing will conduct an evaluation to the extent necessary to determine whether the PIS is adequate or has been appropriately changed to ensure positive control of the product/parts to be added to the PLR. However, if changes to the PIS are substantial, the Manager will convene a PCB to make the determination.

Changes to the PLR are to be formalised by the re-issue of the PLR and the Cover Letter.

After the PLR and cover letter has been approved and signed by the delegate, PI will send the PLR to the applicant with a request to return the superseded PLR.

Deletions to the PLR

Deletions to the products or approved design data listed on the PLR are to be processed using the same process as for additions.

3.2.7 Testing aircraft, engines and propellers

Aircraft

All aircraft produced under a PC must pass an approved production flight test as part of the inspection procedure required for issue of an airworthiness certificate. A Special Flight Permit is issued to authorise production flight-testing under paragraph 21.197 (1) (c) of CASR.

Small aeroplanes and gliders manufactured under a PC and being exported without assembly or flight test under the provisions of regulation 21.325 of CASR are exceptions. However, in these instances, the manufacturer, as a condition of the PC, must provide a CASA-approved assembly and flight test procedures.

Engines and propellers

Engines and propellers produced under a PC must pass a production test approved as part of the quality system data required by paragraph 21.143 (1A) (c) of CASR.

3.2.8 PC holder's location(s)

A PC holder's manufacturing complex may consist of a principal facility and associate facilities using the same quality control system approved by CASA, for the particular type certificated product(s).

The PC is issued to the organisation that controls the final assembly, testing and airworthiness release. The principal facility should be listed on the PC, and all associated facility addresses are listed on the PLR. A post office box address is not acceptable for a facility because the actual location must be identified. However, post office boxes may be used as postal addresses for correspondence.

The issuance of a production certificate is based on the demonstrated capability of the applicant/production certificate holder. Therefore, a production certificate issued under regulation 21.134 of CASR is not transferable to another person. If the PC holder relocates any part of the manufacturing complex, the PC holder is required to apply for a new PC, as per regulation 21.159 of CASR. A new PC under the same number will be issued to reflect the change.

Assessment of an applicant's suppliers

See subsection 4.1.1 for supplier evaluation procedures.

3.2.9 Summary of distribution of production certification documents

The PO is to distribute the PC documents as indicated below.

Application for PC (Form 849)

Original retained on CASA document management system, together with:

- copies of the applicant's legal identity
- licensing agreement(s)
- documented quality control system, when approved.

PC, PLR and signed Letter of Authorisation

The MI or RSO saves the final signed copies of the PC, PLR and signed Cover Letter on the relevant RMS file.

The approved copy of the Quality Manual, including the PIS, is also saved on the RMS file by the MI or RSO.

Request for amendment to the PC

The applicant is to submit Form 849. A Manufacturing PO will assess the application for amendment in accordance with these procedures for revised PC and to ensure compliance with regulation 21.153 of CASR.

The PC and PLR will be re-issued to reflect the amendment.

3.3 Australian Parts Manufacturer Approval

3.3.1 Applicability of APMA

This section covers the assessment and issue of an APMA for replacement and modification parts for installation on a type certificated product, in accordance with Subpart 21.K and regulation 21.303 of CASR.

Note: Additional guidance is contained in AC 21.16 and AC 21.27.

The applicant must demonstrate to CASA that they are compliant with airworthiness requirements on the basis of tests and computations, unless they can show that the part is identical in every respect to the design of a part that is covered under a type certificate. IF the design of the part was obtained by licensing agreement (with STC holder), evidence of that agreement must be provided.

Regulation 21.303 of CASR requires that any person producing replacement or modification parts for sale for installation on a type-certificated product must obtain an APMA. An APMA should be obtained for replacement or modification parts for an STC if they are not being produced under a PC.

Note: Standard parts conforming to an established industry or Australian specification (e.g. AN bolts and nuts) are not eligible for an APMA (in accordance with paragraph 21.303 (2) (e) of CASR).

Imported products

If, in producing a part under an APMA, imported parts are to be used, they must be imported parts in accordance with regulations 21.502 and 21.502A of CASR.

3.3.2 Responsibility for APMA

Applicant

The applicant must show that the design meets the applicable airworthiness standards. The applicant can show compliance by either:

- demonstrating that the design of the part is identical to the design of a part covered under a TC or STC; or
- demonstrating through tests and/or computations that the design of the part meets the airworthiness requirements applicable to the product on which the part is installed. The applicant must assure that no interference with mating or adjacent hardware occurs and that the part performs its intended function.

The applicant must establish and maintain a Fabrication Inspection System (FIS) that meets the requirements of subregulation 21.303 (11) of CASR.

Lodgement of an application for an APMA

Applicants should be advised to complete and submit an application for an APMA (Form 849) PI. The applicant must comply with regulation 21.303 of CASR.

When a person applies to CASA for an APMA, the applicant must provide CASA with a copy of its proposed FIS (unless it has already provided CASA with a copy of it), in accordance with paragraph 21.303 (3) (e) and subregulation 21.303 (3A) of CASR. The FIS must meet certain minimum requirements, set out in subregulation 21.303 (11) of CASR. If it does not meet those minimum requirements, CASA is not required to issue the applicant with an APMA.

Once a person holds an APMA, its FIS must always meet the requirements of subregulation 21.303 (11) of CASR - the obligation in that subregulation is to "establish and maintain" a FIS which meets the requirements of the subregulation. Under paragraph 21.303 (11) (g) of CASR, the system must be documented and include procedures to ensure that major changes to the basic design are adequately controlled and approved before being incorporated in the finished part".

3.3.3 Initial assessment

If Form 849 does not contain all the relevant information, the PO will provide details to PI and the PO will advise the applicant.

3.3.4 CASA engineering assessment

Design assessment

At the discretion of the PO, commensurate with the knowledge and experience that CASA has of the Approved Design Organisation (ADO), Authorised Person and/or applicant, CASA may be satisfied that the design meets the applicable airworthiness requirements on the basis of any of the following is to be reviewed:

- an examination of the design
- technical data for the design approved under regulation 21.009 of CASR
- a certificate provided by an ADO stating that the design data, as defined in paragraph 21.303 (4A) (c) of CASR, meets the airworthiness requirements in relation to the application.

This may require the assessing PO to refer aspects of the design package to certification specialists. Manufacturing – Request for AEB Design Assessment Services (Form 786) should be used to document the request for certification specialist assessment. Where such cases arise, the certification specialist will record the acceptability of the design data on Form 786.

The engineering assessment should determine whether the application for the APMA establishes that the part meets the relevant airworthiness requirements applicable to the type certificated product on which the part is to be installed. Also verify the eligibility for installation of the part on the type-certificated product.

If the applicant's design does not meet all the above design considerations, the PO will advise the applicant accordingly and the application will not be processed any further. Amended design data may be required to resolve outstanding issues.

The approval of design data will be endorsed by the CASA delegate on CASA Form 786.

3.3.5 Compliance considerations

Applicant

The applicant must submit a Compliance Statement listing the applicable regulatory requirements (refer to AC 21.16) and the means or documents to demonstrate that compliance.

PO

Regardless of the method by which an applicant chooses to show compliance as listed on the Compliance Statement, prior to issuing APMA approval, carefully review the application to determine whether the applicant can ensure:

- compliance with the applicable airworthiness requirements
- that the materials conform to the specifications in the design
- that the part conforms to the drawings in the design. This review process requires conformity verification, for each part, to be conducted by CASA
- that the applicant has demonstrated that the fabrication processes, construction and assembly conform to those specified in the applicant's design (in accordance with paragraph 21.303 (8) (d) of CASR)
- that part marking requirements are satisfactory and in accordance with regulation 21.865 of CASR
- continued airworthiness under the applicable airworthiness requirements, including reporting requirements under regulation 21.003 of CASR, for the manufactured part and the product upon which the part is installed.
- verify if the applicant identified the eligibility for installation on type-certificated products
- review reports and approve test plans
- verify if the applicant’s substantiating data show compliance with applicable airworthiness standards.

Depending on the safety significance of the part involved such as critical parts, life-limited parts or products with complex designs, CASA may:

- verify if the safety assessment properly characterises the significance of the proposed part to the safety of its product
- verify if the applicant reported an acceptable service history for the original part
- review the differences between the proposed and original part. Assess the applicant’s technical justification for these differences and associated impacts on the next higher assembly and product. For example, weight and other mass properties can influence

vibratory response and performance of rotating components. Also, assess the applicant's analysis of these differences on an assembly and associated product(s)
- assess requests by applicants for conformity inspections when these inspections are necessary

Note: Where required, the PO is to seek further specialist assistance to make the above determination.

3.3.6 Verification of installation eligibility

The applicant's claim of installation eligibility must be verified by the PO. This may be one or more of the following:

- Licensing agreement with TC or STC holder
- TC data sheet
- Training notes
- Maintenance manuals
- Service bulletins
- Technical publications
- Flight manuals
- Airworthiness directives
- Illustrated parts catalogues (IPCs).

Verify assertions and consult other information at your discretion. IPCs from TC holders provide credible information about installation eligibility for the original part, but the IPCs are not National Airworthiness Authority (NAA) approved. Accept the use of the IPC as the sole means for showing installation eligibility only on non-critical parts. Confirm the authenticity and currency of that IPC and its applicability to the APMA part. Otherwise, consider a combination of IPC and other evidence that supports eligibility.

3.3.7 Service history considerations

The PO is to consider the service history of the part in question and verify that it is not the subject of an Airworthiness Directive (AD), other continued airworthiness problems, or subject to an incident/accident investigation. The PO will engage CASA Continued Airworthiness section, as required, to make this assessment.

Note: In the design review of the part by an APMA applicant, the review must investigate whether the proposed original part is subject to an airworthiness directive (AD) or an incident/accident investigation. If the original part in question is subject to an AD or incident/accident investigation, the APMA applicant will need to consider measures to address these shortcomings in the design of the proposed APMA part. Early discussion with CASA on this is highly recommended.

If the part is subject to one of the above, and the design is identical to the original part and produced under a licensing agreement, use the following guidelines:

- if there is an AD that removes the original part from service, immediately or in the future, the APMA application should be rejected unless the application includes design changes that satisfactorily address the AD problem
- consult with the Manager and specialist staff as necessary to ascertain whether CASA is currently developing or considering development of an AD to remove the

original part from service. Consider delaying processing or rejecting the APMA application if necessary

- terminating corrective action by redesign and replacement is preferable, but not always feasible. Some ADs mandate repetitive inspections of an article to prevent a condition from compromising safety. CASA has the discretion to consider replacement parts that retain the need for these repetitive inspections to attain an equivalent level of safety. Coordinate with CASA - Initial Airworthiness for consensus
- if a part is not identical or substantially identical to the TC holder's part, confirm the applicant shows that installing their part does not create an unsafe condition. Review relevant test reports or witness product-level and assembly-level tests. Do not encourage flight testing outside the CASA approved process
- if the part is having service difficulties and CASA is actively pursuing corrective action (i.e. a design change per regulation 21.099 of CASR) with the TC holder, reject the application for APMA, unless the applicant shows that installing the part does not produce the same unsafe condition
- if CASA and/or the Australian Transport Safety Bureau are investigating an incident/accident where the original part may be causal, CASA may delay or suspend the processing of the APMA application until the part is cleared
- CASA should reject the application for an identical part APMA if:
  - an AD calls for repetitive inspections, but prescribes no terminating corrective action (e.g. no modification or replacement of the part provided)
  - the repetitive inspections are intended to catch failures that may occur before the part reaches the published service life
- CASA should always strive for terminating corrective action; an APMA to produce and distribute identical parts only complicates and prolongs the problem. If the part is subject to service difficulty reports (SDRs) and CASA is pursuing corrective action with the TC holder, the application for APMA should be rejected. Instead, an improved replacement part should be sought
- if the original part has a service bulletin to remove it from service, an APMA for a replacement part is still feasible. A service bulletin alone is not enough to reject an APMA application unless that service bulletin resolves functional or installation disparities that the APMA does not.

3.3.8 Life-limited parts

Review the applicant's substantiation of any life-limited parts. Confirm this data includes analyses and tests that establish a part's life-limit using a life system accepted by CASA. Fatigue tests of these parts by applicants are typically essential to setting life-limits. Prior to APMA issuance and/or instructions for continued airworthiness (ICA) acceptance, ensure applicants have noted material, manufacturing, testing and process controls that preserve the life-limits inherent in their designs. Confirm the applicant publishes these life-limits in their ICA.

For engine articles, review the applicant's substantiation of any influencing parts. Influencing parts are engine parts that affect the environment and operating conditions of a life-limited part in that engine.

3.3.9 Special considerations – identicality

Identicality with a Licence Agreement

Identicality with a licensing agreement is a method used when requesting an APMA approval for a design that is already approved, for example via a TC or STC. A licensing agreement is a commercial agreement between the TC or STC holder and the APMA applicant to produce duplicate parts to the approved design, which is held by the TC or STC holder. The licencing agreement needs to authorise the APMA applicant to use the approved design data specified. In addition, the TC or STC holder agrees to provide the APMA applicant with the required design approval support for any required design changes from time to time. The APMA applicant is to submit a copy of the licensed design data and agreement to CASA in support of the APMA application.

Identicality without a Licence Agreement

Identicality without a licensing agreement is a process where the APMA applicant provides evidence of compliance to CASA that the design of the part meets the airworthiness requirements of the original part in every aspect. This requires applicants to sufficiently define their design to allow comparison of dimensions, tolerances, materials, processes, and specifications.

Making a finding of identicality is typically only possible where the APMPA applicant possesses and submits to CASA as part of their application the respective original equipment manufacturer (OEM) data, drawings, and specifications. CASA uses this OEM data to confirm identicality with the applicants own APMA data.

For the purposes of establishing identicality, CASA may exclude cosmetic attributes like colour. Additionally, a finding of identicality typically infers that the existing product ICA(s) remain valid with respect to the APMA unless otherwise noted. In the event this is not the case, CASA must be wary of making a finding of identicality without sound engineering review and compliance determinations. It is the applicant’s responsibility to provide all necessary information and explanation regarding this issue.

Identicality not found

If the design data (including the manufacturing processes) do not show that the article is identical to a part covered under a TC, reject and return the application to the applicant. Notify the applicant that the design was not identical to that of a part covered under a TC.

3.3.10 Test and computation

Test and computation is a process for design approval via engineering justification and compliance data in which the APMA applicant confirms compliance to applicable airworthiness requirements. It is recommended that the proposed method of compliance, which could include testing, is discussed and agreed with CASA via a plan early in the process.

Test reports and computations show that a part's design meets the applicable airworthiness requirements of its respective product. Use the certification basis of the eligible product from its TCDS to establish the relevant airworthiness requirements for your part. A part's nature lies in its purpose, physical characteristics, interfaces with its products and how its failure modes impact safety. The scope and rigor of each test and computation vary with the nature of the part and includes at least the following:

- a safety assessment that characterizes the nature of the part and its effect on safety
- computations that show regulatory compliance or substantiate the comparative analyses
- test results that show direct regulatory compliance or verify the comparative analyses.

3.3.11 Reverse engineering

Applicants typically use this process to duplicate attributes of parts without original design data. The process entails disassembly, measurement of features, and material and functional analyses of an original part. The process may need subsequent testing to confirm the part's intended function with the APMA part installed. Review the applicant's data to confirm it adequately defines the original's design using appropriate sample sizes. This data defines dimensions, material properties (e.g. microstructure and chemical composition), special processes (e.g. welds, heat treat, coatings), and continued airworthiness requirements of both the original and duplicate part. Confirm use of qualified or accredited laboratories for analyses of materials and processes.

Assess the applicant's rationale for use of any other laboratories (such as in-house labs) in establishing the design of the part. Also, confirm that the applicant has adequately captured potential sources of variability in both the original design and the duplicate part. Potential sources of variability include processing characteristics (lots, billets, etc.), material supply vendor, and other such considerations.

Note: CASA does not qualify or accredit any laboratory. However, CASA must have confidence that the data from all laboratories are adequate to show design compliance to the regulations. To establish the required confidence, CASA may need to review a laboratory's accreditation certificate(s).

Limitations of reverse engineering

Take special care in evaluating identicality based on reverse engineering. Reverse engineering is one way to develop the part's design. However, reverse engineering will not normally produce an identical design. The applicant is unlikely to show that tolerances, processes, and manufacturing specifications are identical. Reject and return applications for identicality that rely solely on reverse engineering or use analyses in their comparisons. Redirect the applicant to the test and computation method.

3.3.12 ICA or maintenance instructions

Review the applicant's proposed ICA or maintenance instructions. In both instances, coordinate the CASA manufacturing assessment and position with CASA Continuing Airworthiness Section. If the applicant proposes that no new ICA or maintenance instructions are necessary, assess the applicant's rationale.

3.3.13 Rejecting an application

PO

CASA in general does not have access to the commercial in confidence original certified data in order to make a determination of identicality. In practice, identicality can only be established

for parts manufactured to design data supplied under licensing agreement with a TC or STC holder.

That the applicant may submit inspection and test reports to substantiate that the design and manufacturing data will produce a part that meets the airworthiness requirements and is safe for installation on applicable type-certificated products. The PO will seek further information from the applicant when the airworthiness of a part cannot be assured solely by the showing of equivalence to the design covered under a TC or the design cannot be shown to comply with the original TC design standard.

3.3.14 Considerations for the PO

Review and evaluate the test schedule submitted prior to any CASA test to determine if it is appropriate for the part. Where necessary, certification specialist should be engaged at the discretion of the PO.

Ensure the part conforms to the design data and/or the test proposal before testing. It should be noted that conformity may need to be conducted in stages for parts involving complex manufacturing processes such as composites production.

3.3.15 Evaluate the data package

The PO will:

- evaluate each applicant's capabilities to reproduce a part on a case-by-case basis.
- coordinate with the relevant specialist to ensure that the manufacturing process produces replacement and modification parts according to the approved design.

All applications should include:

- detailed design criteria, including drawings, technical data necessary to establish structural strength, part marking information, and process specifications necessary to define the configuration.

Note: For engineering design modifications approved under regulation 21.437 of CASR, the depth of assessment may be varied at the discretion of the engineer.

Other data necessary to establish the pertinent characteristics of the part:

- the applicants must identify detail drawings as their own unless evidence of a licensing agreement is submitted. Confirm the drawing control procedures (e.g. revision history) are commensurate with the safety significance of the part. In evaluating any data package, consider the following:
  - **manufacturing and process specifications:** may affect the airworthiness of the part. If the applicant's detail drawings reference the TC holder's process specifications, those specifications must be submitted. As the data package is reviewed, coordination with the CASA type certification specialist personnel may be necessary to determine what effect these specifications may have on the airworthiness of the design or to a finding of identicality (see Special considerations – identicality on page 39). For critical parts, coordination with the relevant specialist may be required.

- **master control drawings:** or their equivalent must be carefully evaluated to determine whether the applicant has appropriate control over the configuration and manufacture of the part. The applicant must submit all applicable detail drawings and specifications for acceptable evaluation of the sources listed on master control drawings. The applicant must have satisfactory and verifiable control procedures included in the FIS for vendor supplied items prior to the issue of the APMA.
- **drawing notes:** The PO, with particular reference to any drawing notes or process specifications identified on the drawing, should check the applicant's ability to produce conforming parts before issuing APMA approval. Pay particular attention to the viability of identicality applications that use TC drawings or specifications with notes stating the following:
    - parts supplied to this drawing shall be in strict accordance with samples (first articles) approved by (name of applicant) engineering department unless prior written approval is given to subsequent change.
    - source approval is required for raw stock through total fabrication.
    - the drawing represents a critical item and must successfully complete substantiation tests and be approved by engineering.
    - other similar statements implying special source selection criteria.

Note: If the applicant cannot provide the above information to support identicality, refer the applicant to the test and computation method.
After APMA approval, any major changes to the processes and/or specifications controlling the manufacture of the part (or the use of industry standards over original equipment manufacturer [OEM] processes/specifications) should be assessed by the applicant and reviewed by CASA as needed.

- **dimensional tolerance:** variations in the sample measurements and accepted engineering practices determine the tolerances in part dimensions. The resulting tolerances for the APMA part cannot exceed the minimum and maximum dimensions measured on the sampled approved parts. Exceeding these limits requires further substantiation and acceptance by CASA.
- **material analysis:** Semi-quantitative methods of determining material properties are not supported by CASA as acceptable for standalone processes. For such methods, unless using the material specified in the OEM design data, full material testing would be needed in order to establish a basis for comparison to the OEM material.
- **part marking requirements:** Check the part's marking scheme specified in its design drawings. Regulation 21.865 of CASR sets the marking requirements for APMA parts. The drawings must specify a permanent and legible method of marking. These markings must identify the part with 'APMA' in capitals, the production approval holder (PAH) trademark, name or symbol and the part's part number and the part's serial number (if any) and the name and model designation of each type certificated product to which the part may be fitted. CASA may give an exception to the PAH in writing to the provision of "the name and model designation of each type certificated product to which the part may be fitted".

- **impracticable to part mark:** Often the number of eligible type-certificated products is too long to include with the part. Since the list is likely to change, a tag or label on a container may refer to the applicant's publicly available part eligibility information (refer to regulation 21.880 of CASR). Critical parts also follow the marking requirements in regulation 21.850 of CASR. The method for marking a critical part is essential design data that CASA reviews. The applicant ensures and CASA confirms the marking location and that the process does not degrade airworthiness. To do this, CASA requires applicants to define the marking location and method on their drawings.
- **marking an assembly:** Applicants apply APMA part markings required by regulation 21.865 of CASR. It may not be necessary to part mark all lower level parts of aeronautical product that are produced under an APMA. Part marking may be applied to the highest-level assembly of the approved replacement or modification part. It is not a requirement to part mark on sub-assemblies or individual detail parts unless such parts are to be used as an individual replacement part.
    - For example, if the highest-level assembly is a hydraulic pump, mark the hydraulic pump assembly accordingly. Part marking the detail parts of the pump is optional, unless the individual parts will be released as distinct replacement parts for the maintenance of the higher assembly. The APMA holder's design data may contain the marking information for detail parts of the assembly. This provides a means of tracing the individual detail parts to their related APMA assemblies.
- **part numbering:** If the APMA part replaces an original part, the applicant assigns a part number that distinguishes the APMA part number from the corresponding TC holder part number. Adding a prefix or suffix to the TC holder's part number is enough as long as the prefix or suffix does not compromise the TC holder's part marking practices.
- **parts manufactured under license:** When the APMA basis is identicality by showing evidence of a licensing agreement, the APMA part may have the same number as the type-certificated part. However, we require the applicant to meet the requirements of regulation 21.865 of CASR.

3.3.16 FIS assessment

The PO is to make sure that the FIS required by subregulation 21.303 (11) of CASR has been established and is ready for assessment. The data from the design/production holder should be nominated and confirmed as controlled data.

Once notified by the applicant that the FIS is established, the PO or delegated person is to carry out an assessment of the FIS in accordance with Chapter 4.

Ensure the FIS includes procedures for the marking of parts in accordance with Subpart 21.Q of CASR requirements.

Facilities inspection

The PO is to conduct an evaluation of the applicant's facility in accordance with subregulation 21.303 (5) of CASR, including any supplier's facilities as appropriate, to

determine whether the facilities are suitable for manufacturing the nominated parts and that the applicant's FIS is operating effectively. When the APMA approval is drafted it should include all approved manufacturing locations. In accordance with subregulation 21.303 (10) of CASR, CASA is not required to issue an APMA if the manufacturing facilities for the part are located outside Australian territory, unless the location of the manufacturing facilities places no undue burden on CASA in administering the applicable airworthiness requirements.

Validation of the applicant's conformity inspection

The PO is to conduct validation conformity checks, as necessary, to ensure conformity of the parts to the approved design drawings and data as undertaken in accordance with the applicant's FIS in compliance with subregulation 21.303 (8) of CASR. This verification may need to be conducted during several stages of the manufacturing process for complex products such as composite structures.

Validation conformity checks include incoming materials and processes used in producing the conformed part. Parts inspected for conformity are to be recorded on the Conformity Inspection Record (Form 882), together with comments regarding identified non-conformities.

An agreement must be reached with the applicant as to how the identified non-conformities will be addressed and, if necessary, the FIS re-presented to CASA.

Manufacturing procedures

When satisfied that the manufacturing facilities, procedures and processes and inspection system comply with subregulations 21.303 (8) and (11) of CASR, an SFR is to be recommended and submitted to the CASA Delegate.

3.3.17 APMA approval

Design acceptance/approval

The PO will:

- confirm design compliance
- confirm that satisfactory manufacturing processes, material control and FIS have been assessed and are acceptable
- ensure that a master drawing list or similar has been prepared and dated at the revision level
- ensure that all drawings and data required are listed. Make sure that a copy of the submitted data package is retained on the project files.

Final APMA approval

The PO will:

- draft an SFR, APMA Cover Letter (Form 790) (in accordance with regulation 21.303 of CASR) together with an APMA Supplement (Form 791) for approval by the CASA Delegate.

Note: When an APMA is based on a licensing agreement for a specific period of time, the same period of time must be indicated on the APMA Cover Letter and Supplement as a limitation to the authorisation.

- reconcile costs using the CASA estimator and submit to PI, once the APMA Letter and Supplement have been approved.

The RSO will:

- forward the original documents to PI for on forwarding to applicant and to close the job
- update document management system with the permissions/certificate issued
- update surveillance schedule, as required.

3.3.18 Design changes

Under subregulation 21.303 (6) of CASR, CASA is not required to consider an application unless the applicant has complied with paragraphs (8) (b), (c) and (d). Under subregulation 21.303 (7) of CASR, the applicant must ensure that no change is made to a part between the time compliance with paragraphs (8) (b), (c) and (d) is shown for that part and the time the part is presented to CASA or a relevant approved design organisation for inspection or test.

Under subregulation 21.303 (8) of CASR, an applicant for an APMA must make all inspections and tests necessary to determine the following:

- compliance with the applicable airworthiness requirements; that materials conform to the specifications in the design
- that the part conforms to the drawings in the design
- that the fabrication processes, construction, and assembly conform to those specified in the design.

Therefore, all design changes to the basic design before an APMA is issued must be submitted to CASA for assessment.

In relation to design changes to the basic design after APMA is issued, CASA may allow the applicant to have a procedure in the FIS which details how they can make and manage a minor change to the basic design (provided the APMA has not been issued with any condition which requires all design changes to the basic design to be submitted to CASA for assessment).

3.3.19 Changes to an existing APMA

The PO should conduct or arrange for an evaluation, as appropriate, when additional parts are approved to an original APMA approval or when the manufacturer makes changes to the FIS or relocates a facility. Additional parts will require an additional APMA supplement.

Advice to CASA of changes to a FIS or location

A PAH is required to notify CASA within 10 days of any change to the manufacturing facility (in accordance with subregulation 21.303 (13) of CASR), and within 2 days of any change to the FIS (in accordance with subregulation 21.303 (13A) of CASR).

On advice that a facility has been expanded or relocated, the Manager is to appoint a PO to determine the likely airworthiness impact. All changes to the FIS will need to be evaluated by the PO.

When issuing an APMA the applicant should be encouraged to include suitable procedures in the procedures manual for having changes to the FIS approved by CASA before implementation so the approved system can be maintained.

If conformity is affected, the APMA holder is required to quarantine production until the change is approved.

APMA data package

The recommended content of an applicant's data package is given in AC 21.16. Provision of this information will assist assessment of the application along with the information contained within this manual.

Statement of conformity

A Form 724, for first article Statement of Conformity, should be provided with each application. Use of the form prompts the applicant for the required information to process the application.

3.4 Australian Technical Standard Order Authorisations

3.4.1 Applicability – ATSOA

An ATSOA is a CASA design and production authorisation, issued to a specific manufacturer of an article which has been found to meet or exceed a specific ATSO/TSO/ETSO performance standard, or other performance standard accepted by CASA.

An ATSOA must be obtained by persons who want to manufacture ATSO articles under Subpart 21.O of CASR. An ATSOA holder is a manufacturer who controls the design and quality of an article produced under the ATSOA, including all related parts, processes or services obtained from an outside source. An ATSOA allows the holder to identify the article with an ATSO marking. However, an ATSOA does not confer installation authority. The installation of an article manufactured under an ATSOA must be approved separately in a manner acceptable to CASA; for example, under a design approval pursuant to Subpart 21.M, a Supplemental Type Certificate or Type Certificate".

The ATSOA system does not apply to parts produced under an APMA, TC only, or a PC.

3.4.2 Advising the applicant

The PO will advise the applicant that:

- an ATSOA consists of the design approval and PA
- an ATSOA can only be obtained for the current ATSO/TSO/ETSO for the particular article
- AC 21.601 and AC 21.27 contain guidance on what are acceptable requirements for ATSOA and associated quality systems.

3.4.3 Lodgement of an application

The applicant (or the applicant's authorised agent) must submit an application for an ATSOA to PI using Form 849.

The application must be accompanied by those documents required by regulation 21.605 of CASR, and any documents required by the performance standard.

3.4.4 Issue procedure

Design approval

On receipt of the application, PI will forward it to CASA Manufacturing Section.

The Manager

Upon receipt of a notification of a new application or a variation to an application from PI, Manager will:

- assign a PO to the task to
  - provide input to the cost estimates
  - provide input on completion dates of the various phases of the application, namely, documentation evaluation, inspection and tests, and certification processes.

The PO

On receipt of the application, check all incoming material to determine that documents and all data conform to the requirements of regulation 21.605 of CASR.

If the data is incomplete, provide guidance to PI to advise the applicant that no further work will be done until the missing data are supplied.

Regulation 21.605 of CASR requires that an applicant must show that the design of the article meets the minimum performance standards specified in the applicable ATSO, TSO or ETSO that is effective on the date of application for that article.

CASA may be satisfied that the design of the article complies with the applicable ATSO, ETSO or TSO, including any deviations approved under regulation 21.609, on the basis of any of the following:

- an examination of the design
- the technical data for the design approved under regulation 21.009
- a certificate from an approved design organisation under subregulation 21.605 (7).
- Examination of the technical data to ascertain that the technical requirements of the ATSO are met. The examination should include-
  - a check of the adequacy and validity of technical data and test results
  - conformity of the test article to design data
  - drawings and prescribed equipment installation information, and specified limitations should be checked for completeness and adequacy since such data are important to evaluation of aircraft type designs as well as for determination of the ability of the applicant to produce duplicate articles per subregulation 21.605 (4) of CASR.

  This may require the assessing PO to refer aspects of the design package to certification specialists. Form 786 should be used to document the request for certification specialist assessment. Where such cases arise, the certification specialist will record the acceptability of the design data on CASA Form 786. The approval of design data will be endorsed by the CASA delegate on CASA Form 786.
  - notifying the applicant in writing of any omissions

- a visit to the applicant's facility for the purpose of appraising the applicant's competence to certify conformance with the ATSO. This visit should determine that compliance tests, as prescribed, are being realistically conducted.
- a foreign NAA has conducted the examination of design, on CASA's behalf, under the authority of an existing international agreement.

3.4.5 Quality system data compliance

The applicant for an ATSOA must submit, along with the application, a written description of the quality system in the detail specified in regulations 21.143 and 21.144 of CASR. The quality system data compliance is determined in the following manner:

The PO will

- conduct a thorough evaluation of the quality system data submitted by the applicant
- ensure all unsatisfactory conditions are addressed if evidence of quality system deficiencies are noted
- carry out the procedures detailed in Chapter 4, to determine compliance with regulations 21.143 and 21.144 of CASR. The quality system data must include an acceptable test procedure meeting the ATSO requirement to which each production article will be tested.

Note: Guidance on an acceptable quality system is in AC 21.27.

An ATSOA holder's manufacturing complex may consist of a principal facility and associate facilities using the same quality control system approved by CASA.

The ATSOA is issued to the applicant at the address of the principal manufacturing facility that controls the design and quality of the product(s). The principal facility, and all associate facility addresses are listed on the ATSOA. A post office box address is not acceptable for a facility because the actual location must be identified. However, post office boxes may be used as postal addresses for correspondence.

ATSOAs may not be transferred; relocation of facilities or name change negates the current ATSOA. However, an application for a new ATSOA may be made based on previously approved data. If an ATSOA holder moves a manufacturing facility to a new location, CASA must conduct an assessment at the new location to ensure that the ATSOA holder continues to comply with regulations 21.605 and 21.607 of CASR. The PO will need to determine whether or not the data complies with regulation 21.605. When the quality system is found to be unsatisfactory, the PO will note the deficiencies and advise the applicant.

3.4.6 Issue of the ATSOA

PO:

When satisfied that both the design approval aspects and quality control data aspects are compliant, forward a recommendation via an SFR and draft ATSOA letter to the CASA Delegate.

Once the ATSOA Letter has been approved, reconcile costs using the CASA estimator and submit to PI.

The RSO will:

- forward the original documents to PI for on forwarding to applicant and to close the job
- update document management system with the permissions/certificate issued
- update surveillance schedule, as required.

Issue of Letter of ATSO Design Approval

A letter of ATSO design approval may be issued for an article that is manufactured in a foreign country with which Australia has an agreement for the acceptance of these articles for export and import.

CASA will issue a letter of ATSO design approval if the NAA of the country in which the article was manufactured certifies that the article has been examined, tested, and found to meet the applicable ATSO or the applicable performance standards of the country in which the article was manufactured, and any other performance standards CASA prescribes to provide a level of safety equivalent to that provided by the ATSO.

Moreover, the article manufacturer also needs to submit to CASA one copy of the technical data required in the applicable performance standard through the NAA of the country in which the article was manufactured.

Foreign manufacturers who want to obtain a letter of ATSO design approval, (as provided for in regulation 21.617 of CASR) must submit their application through their NAA to PI via:

Civil Aviation Safety Authority

GPO Box 2005, Canberra, ACT 2601

Australia.

3.4.7 Post-issue compliance

Subsequent revisions to the quality system must be submitted by the ATSOA holder to PO to determine compliance with regulations 21.143 and 21.144 of CASR. The assigned PO is to advise the ATSOA holder as to whether or not the revisions comply with these regulations.

Changes to the design data may be made by the ATSOA holder in accordance with CASR 21.611.

An article manufacturer manufacturing an article under an ATSO authorisation may make minor design changes (any change other than a major change) without further approval by CASA. In this case, the changed article keeps the original model number (part numbers may be used to identify minor changes).

Any design change by the manufacturer that is extensive enough to require a substantially complete investigation to determine compliance with an ATSO, ETSO or TSO is a major change. Before making such a change, the manufacturer must assign a new type or model designation to the article and apply for an ATSO authorisation under regulation 21.605.

3.5 Approval of materials, parts, processes and appliances

3.5.1 Process Approval

Subpart 21.K provides for approval of the use of materials, parts, processes and appliances. Under the provisions of regulation 21.305 of CASR, Whenever a material, part, process, or appliance is required to be approved under this Part, it may be approved:

(a) under an APMA; or

(b) under an ATSO authorisation or letter of ATSO design approval; or

(c) in conjunction with type certification procedures for an aircraft, aircraft engine or propeller; or

(d) under Subpart 21.N; or

(da) in a manner prescribed by the Part 21 Manual of Standards; or

(e) in any other manner approved by CASA.

3.5.2 Application

Applicants seeking CASA specific approval of the use of a material, part, process or appliance under subregulation 21.305 (e) of CASR should be advised to lodge their application on Form 849. The application should include details regarding:

- the identity of the type certificated product or part on which the material, part, process or appliance will be utilised
- the name and address of the manufacturing facility
- material, part, process or appliance specification details, including any test reports and/or material's physical and chemical properties
- reports and computations necessary to show that the use of the material, part, process or appliance is compatible with, and does not in any way compromise, the design of the type certificated product or part on which it is utilised.

The applicant may be required to:

- carry out any other tests that CASA considers necessary to verify material, part, process or appliance specifications
- carry out appropriate tests to show the effect of the material, part, process or appliance in service.

Notes: Regulation 21.305A provides a mechanism for someone to apply to CASA for an approval (such as a PA to manufacture a part that is not an APMA or ATSOA part).

Subregulation 21.305 (e) provides flexibility to approve the part for fitment to a Type Certificated aircraft.

A 'Process Approval' issued by CASA (traditionally) has been issued under regulation 21.305A of CASR, approving the process, and contains approving the part manufactured within an approval under subregulation 21.305 (e). A Process Approval is issued using Form 789 - Process approval letter template and Form 802 - Process approval supplement.

4 Assessment of Applicant's Quality Systems of Manufacture

4.1 General principles

The purpose of this part is to assist in assessing quality systems of applicants seeking PAs under Subparts 21.F, 21.G, 21.K or 21.O of CASR (production under TC certificate only, PC, APMA, ATSOA).

Not all the functions/elements specified in this part are necessarily applicable to every applicant's system, and the assessing officer before undertaking this assessment should ensure a good understanding of the applicant's organisation and the extent of the manufacturing work to be undertaken. All aspects of the intended manufacturing activity must be clearly and adequately specified in the applicant's quality system.

Assessment stages

Assessment of any quality system is normally a three-stage process.

(1) Stage 1: Quality system assessment—desk-top review

  (a) Conduct a 'desk top' review of the applicant's system to ensure that all the required procedures are included and adequately address the regulatory requirements.

(2) Stage 2: Quality system assessment—quality system evaluation

  (a) Evaluate the system at the manufacturing facility or facilities including supplier facilities to ensure that the procedures have been documented, implemented and effectively control the work.

(3) Stage 3: Quality system assessment—manufacturer's corrective action

  (a) The manufacturer rectifies any noted deficiencies and discrepancies by amending documented procedures or correcting discrepancies at the manufacturing facility or facilities.

Quality systems documentation

All PA applicants are required to establish and maintain a quality system. It follows that the documented system must contain adequate procedures for the maintenance of the approved system. The documented system should identify the person who is responsible for CASA liaison and will approve and implement quality system changes within the entity.

Quality systems for PC and ATSOA applicants are required to comply with regulations 21.143 and 21.144 of CASR. The quality system must be documented in a manual, and must include procedures for the following functions:

- organisation structure, authority and responsibility of APs
- technical data control
- manufacturing processes
- special processes
- non-destructive inspection (NDI)
- tool and gauge control

- receiving inspection/supplier control
- inspection and testing
- material review procedure (Except for a CASR Part 21.133(2B) PC)
- stores control
- certification and release
- service difficulty reporting and control
- internal audit.

The quality system requirements for APMA (FIS) must also address all of the items listed above. The regulations covering the approved PIS and FIS, for Production under TC only and APMA, do not contain a specific requirement for the applicant's organisational structure to be included. However, paragraph 21.123 (1) (c) and subregulation 21.303 (11) of CASR requires the applicant to establish and maintain a system which ensures that each completed product or part conforms to its design and is safe for operation or installation.

Establishment of evaluation teams

The PO shall coordinate with relevant manufacturing and specialist staff to conduct an evaluation of an applicant's quality system. When the application is for manufacture of aircraft, the flight test personnel from A&EB are required to evaluate the relevant sections of the data and approve the production flight test schedule.

4.1.1 Assessment of applicant’s suppliers

Preliminary and ongoing audits of the supplier’s facilities

This section provides guidelines for CASA’s assessment of an applicant’s supplier production facility to ensure that the supplier control system implemented by the PAH meets the intent of Part 21 of CASR. The PAH has initial and on-going responsibility for control of suppliers. CASA may undertake audit of the facilities.

Subparts 21.F, 21.G, 21.K, and 21.O of CASR require the establishment of a quality system as a prerequisite to the issue of a CASA PA. A critical part of such a system is to establish and maintain procedures for ensuring that components and materials produced by suppliers conform to the approved design data and are in a condition for safe operation.

It is the PAH's responsibility to ensure that each completed product, part or appliance, including supplied components and materials, conforms to the approved design data and is in condition for safe operation.

When suppliers are located outside of Australian territory, CASA may request assistance from the NAA of the foreign country to act on its behalf, to perform assessment (and audit) activities. Such assistance may come under the terms of bilateral agreements, memorandums of agreement between the authorities, or requests for assistance on a case-by-case basis.

Consideration should be given to ensure that the use of an overseas supplier does not impose any undue burden on CASA. It should be communicated at the earliest possible stage of the application process; normally during a Pre-Application or PCB meeting, that use of overseas suppliers may require audits of the supplier facility to be conducted by CASA.

The scope of work that can be conducted by overseas suppliers should be categorised using the following considerations:

An initial onsite assessment and ongoing surveillance conducted by CASA of overseas suppliers should be conducted when:

- suppliers are providing Class 1 and Class 2 products to the PAH
- suppliers are providing Class 3 products that cannot be completely inspected during receipt by the PAH. For example:
  - a seat assembly that has sections that have been closed up during manufacture
  - a metal assembly that has been riveted together that cannot be inspected internally without destruction of the part
  - parts that have been subjected to critical special manufacturing processes such as welding or non-destructive testing.

In addition to CASA oversight, the PAH approved quality system/PIS/FIS should detail the following:

- a rigorous supplier control program, that includes a risk assessment process, is implemented by the PAH, including a supplier onsite audit program
- all products receipted by the PAH are to be accompanied by documentation to support control over the manufacturing process. For example:
  - job travellers or worksheets
  - material certificates
  - testing results
  - certification for special processes.
- details of any contractual obligations or supplier arrangements
- list all of the parts that are produced overseas and which supplier is manufacturing them.

Simple Class 3 products manufactured by overseas suppliers may be authorised without the need for CASA to conduct an onsite assessment or ongoing surveillance using the following guidelines which should be contained within the approved Quality System/PIS/FIS:

- a rigorous supplier control program is implemented by the PAH, including a supplier onsite audit program.
- detail that all products receipted by the PAH are to be accompanied by documentation to support control over the manufacturing process. For example:
  - job travellers or worksheets
  - material certificates
  - flammability testing results
- details of any contractual obligations or supplier arrangements.

Some examples of products that may be considered as simple Class 3 products include:

- curtains, carpets and seat covers
- sheet metal parts that are able to be completely conformed when receipted by the PAH. This includes parts that have been subjected to simple special process requirements such as alodine or painting.

A PAH may utilise any supplier as long as the PAH's quality control system provides assurance that all parts or services, including engineering services, furnished by a supplier are in compliance with its PA.

The PAH should place special emphasis on controlling those suppliers that it authorises to deliver parts/materials directly to a user/operator of the PAH's completed product. Each PAH should make available to CASA a list of its direct ship suppliers. The PAH should have objective evidence that the suppliers have been notified that their facilities are subject to CASA surveillance.

Emphasis is placed on the PAH's control of its suppliers, since the PAH is completely responsible for all of its supplier-furnished parts and services. CASA may evaluate the PAH's quality system implementation at selected suppliers.

Assessment

The same procedures and criteria used to accomplish and record assessment of the PAH quality system and facilities are to be used for evaluating suppliers, even though not all elements may be applicable to individual suppliers. MI's are to exercise their judgment and experience in performing supplier assessments. These procedures and criteria are detailed in section 4.1.2.

Note: When a supplier to multiple PAHs is evaluated, it is of the utmost importance to ensure that the quality control requirements for the applicant being currently evaluated are met by the supplier.

4.1.2 Stage 1: Quality system assessment—desk-top review

System evaluation

This stage is a thorough evaluation of a manufacturer's system (including any referenced procedures, policies, standards, instructions, processes), which describes the quality system required for a particular PA.

Evaluation method

It is of the utmost importance that the PO critically evaluates the submission to ensure that:

- the described quality system will adequately provide for the consistent acceptance of only those products/parts that conform with the approved design data
- the manufactured products/parts are in a condition for safe operation.

The prime objective of all quality system data is to ensure that it describes the procedures that meet the intent of the pertinent regulations, and can be realistically implemented. Applicants must understand that penalties can apply to non-compliance with the approved system; therefore the system described must reflect 'local' operations rather than 'generic' procedures.

Things for consideration include the following:

- the PO should use Manufacturing Approval Desktop Review (Form 787) to aid in the evaluation of the applicant's quality system
- all documents must be positively identified by title, revision, and date; and must be approved for use by an authorised management representative (often the Quality Manager, CEO or Managing Director)

- the initial evaluation of a manufacturer's quality system documents must be thorough and comprehensive. However, any subsequent evaluation of a particular manufacturer's quality system may consist of:
  - a cursory review of previously submitted data to determine whether or not it has remained adequate.
  - a thorough review of any data that has been revised since the last evaluation.
  - a thorough review of any new data that has been developed and implemented since the last analysis—for example, review of the quality assurance provisions of a new bonding process introduced subsequent to the last analysis.
- when evaluating the system, inspectors should flag:
  - any ambiguous data that may be subject to misinterpretation.
  - any overly complex or cumbersome inspection procedures that may be difficult to implement, be disregarded or even circumvented.

Consistency of compliance standards

Although the CASR Part 21 PAs require different types of production control systems, this does not mean that less stringent standards are acceptable for manufacturers of like products or parts. Notwithstanding the type of PA held, the product or part must, when completed, conform to its approved design and be in a condition for safe operation.

Quality system elements

The system elements detailed in and Appendix A of AC 21.27 is information that is common to all PAs, although the level of detail required to ensure control of any particular element may vary between the different types of approvals. Evaluating inspectors must be satisfied that the applicant has adequately addressed each necessary requirement and the procedures are satisfactory to ensure the product or part conforms to the approved design.

Note: In describing the quality system, references to other documents or data maintained by the applicant may be used, provided that a brief description is included in the quality system. All referenced documents must be submitted for evaluation.

4.1.3 Stage 2: Quality system assessment – quality system evaluation

This stage of the assessment consists of an evaluation of the quality system at the production facilities and supplier facilities to determine that the applicant has satisfactorily implemented and is capable of maintaining the required quality system. During this stage inspect parts applicable to the application in order to assess the applicant's ability to produce conforming parts or products. Refer to subregulations 21.123(1), 21.135, 21.303(5) and 21.605(4) of CASR.

System assessment

An adequately described system is useless if not properly implemented and maintained. The PO must therefore ensure that the manufacturer practices rigid system discipline. CASA does not dictate to a manufacturer the specific manner in which a product will be produced. However, once a manufacturer commits to a specific system that is approved by CASA, the manufacturer is obligated to adhere to every facet of the system without deviation. Whenever a change to the system is necessary, the manufacturer must make the change in accordance

with the provisions of their approved system prior to implementation. The following guidelines should be utilised during the course of evaluating a manufacturer's quality system functions:

- use the standards described under the considerations and analysis criteria in Appendix A of AC 21.27
- be alert to any inadequacies in the system, such as a lack of necessary instructions or procedures, or, more commonly, repetition of regulatory requirements instead of proper procedures. It is virtually impossible during the desk-top review of section 4.1.2 to determine whether the submitted system complies with all regulatory requirements and provides the necessary safety assurances.

Findings

When a non-conformance to the design or design data is noted, the PO must continue with the evaluation to determine whether the condition is a symptom of a quality system deficiency or breakdown. When a quality system deficiency or breakdown is indicated, the inspector must evaluate and determine if the applicant has adequately identified the cause. Necessary corrective action must be taken by the applicant to ensure the quality system remains compliant and effective (see section 4.1.4).

4.1.4 Stage 3: Quality system assessment—manufacturer's corrective action

Before CASA can approve the application, the manufacturer must complete corrective action to address all deficiencies or discrepancies arising from assessment of an initial application or change to an existing system.

This stage is completed when the inspector finds that the manufacturer's corrective actions and quality system amendments comply with all pertinent CASR Part 21 requirements and conforming products or parts have been produced following the final form of the quality system submitted for approval.

4.1.5 Manufacturer’s service documentation

The PAH may need to issue service bulletins, service letters or other continuing airworthiness information.

CASA only approves the relevant technical content of a service bulletin if it is required to address an Airworthiness Directive. The PAH is to submit such a proposed service bulletin to CASA for engineering assessment and approval of the technical content in the form of a letter to the PAH authorising the issue of the service bulletin.

The PAH is permitted to issue any other service bulletins or service letters etc. without reference to CASA. However, changes to a design must be approved in accordance with the PAH’s Procedures Manual.

4.1.6 Service difficulty reports

In-service SDRs received by CASA relating to production item issues will be processed in accordance with CASA’s SDR procedures, and referred to the relevant specialists.

4.1.7 Reporting of failures, malfunctions and defects during manufacture

The holder of a type certificate, a supplemental type certificate, an APMA or an ATSO authorisation, or the licensee of a TC or STC, must report to CASA any failure, malfunction, or defect in any of the following that has resulted in any of the occurrences listed in subregulation 21.003 (4) of CASR:

a. an aircraft, aircraft engine or propeller, or any other part or article manufactured by it.

b. a manufacturing process specified by it.

The holder of a TC, a STC, an APMA, or an ATSO authorisation, or the licensee of a type certificate or supplemental type certificate, must report to CASA any defect in any aircraft, aircraft engine or propeller, or in any part, or article manufactured by it that has left its control and that could result in any of the occurrences listed in subregulation 21.003 (4) of CASR.

4.1.8 Supplier quality control

Suppliers are not required to have a quality manual and have no regulatory privileges or responsibilities. However, they cannot sell production parts on the open market without their own PA.

4.1.9 Engineering drawings

Drawings reviewed by CASA and used in the conduct of conformity inspections must meet the minimum standards of the CASRs. CASA regulations require that an applicant submit sufficient drawings, special process documents, specifications and test reports to identify and substantiate the product for which CASA approval is sought. CASA reviews this data for minimum compliance with the airworthiness standards. That data is then used for inspecting the product. CASA uses the data to witness a conformity inspection of the product at the applicant's facility, or at an agreed upon location. Provided all of the drawing requirements have been met, the product is then tested. If the test is acceptable, the product is approved, and the applicant proceeds to manufacture the part/assembly.

Once a CASA approval is issued, the drawings used to inspect the original product are considered to be the approved CASA baseline. That baseline never changes unless there is a modification to the drawings after the approval is issued. Any deviations from the drawings for a part or assembly must be documented, dis-positioned, and approved in the same manner as the original drawings were.

CASA will accept drawings that meet some recognised drawing standard (equivalent to AS 1100) to enable the production of a quality part within a minimum tolerance range.

4.1.10 Use of CASA Form 001 - Authorised Release Certificate

Manufacturers holding a PA may sign an ARC to accompany a finished part. Instructions to complete the ARC are contained within Form 001i (refer to the forms table for link).

For use by the holder of a One-off PC in Block 12 'Remarks,' add the words:

- "This ARC is issued under the provisions of subregulations 21.133 (2B) of CASR"; and
- "This part is manufactured for Certificate of Approval Holder number xxx or an Approved Maintenance Organisation (AMO) number xxx engaged in maintenance (or owner/operator by name, as appropriate) per order number yyy
- 'Remarks' should also provide details (S/N or Tail No.) of the aircraft, aircraft engine or propeller.

For use by the holder of an APMA in Block 12 'Remarks,' add the aircraft eligibility as per the approved APMA Supplement applicable to the part being released.

4.1.11 Use of an ARC for unapproved parts

These are parts produced (and to be conformed) to certain controlled design data that has not yet been approved to be part of the type design. Usually, these parts are for use in a ground or flight test development or certification program (i.e. usually a prototype).

Neither the manufacturer nor CASA can sign a release for fitment to a certificated aircraft for such a part.

Refer to Form 001i, paras 3.4.12, 3.4.13 and 3.4.14 for detail on how to fill an ARC for a Prototype part made to non-approved design data

5 Conformity

5.1 Conformity verification and conformity inspection

The terms 'conformity verification' and 'conformity inspection' are sometimes used interchangeably although they are used for specific purposes within the manufacturing regulatory framework.

This section will provide guidance on the intent of 'conformity verification' and 'conformity inspection' as they are applicable to Type Certification, Supplemental Type Certification and the manufacturing processes.

5.2 Conformity verification

Conformity verification is the process used during the TC/STC review and assessment phase to make sure that the aircraft, aircraft engine, propellers or aeronautical products to be certified conforms to an approved design. It also ensures the consistency and repeatability of manufacture in accordance with approved processes until the issue of a PA. The process is detailed in a Conformity Verification Plan (CVP), which includes a Conformity Verification Matrix (CVM).

The CASA Type Certification Procedures Manual provides information on the TC/STC process.

5.2.1 Defining conformity verification requirements

Conformity verification requirements are defined very early in the TC/STC review and assessment phase by the Manufacturing Specialist on the Type Certificate Board (TCB). Conformity verification requirements are determined and agreed jointly by CASA and the applicant.

The intent of this joint definition and agreement is to make sure that conformity requirements that are defined are measurable and can be tested for acceptability. During the TCB the skeleton framework of the CVP is developed using the Certification Plan as source data.

Conformity verification requirements must be defined against an approved/frozen design baseline.

The CVP

The purpose of the CVP is to make sure that the aircraft, aircraft engine, propellers and aeronautical products to be certified conforms to an approved design. It also ensures consistency and repeatability of manufacture of the aircraft, aircraft engine, propellers and aeronautical products in accordance with approved processes until the issue of a PA. The manufacturing project officer is responsible for managing the CVP.

The CVM

The CVM supports the CVP and is the document that details all the products that must be conformed. The CVP also records the agreement reached between the applicant and CASA on who will 'recommend' and 'find' conformity.

The CVP provides the conformity verification approach that will be followed by the applicant and CASA and, in essence, determines the policy of the specific project conformity verification requirements. The CVP will be approved with a first issue of the CVM and, normally, the CVP will remain fairly stable while the CVM will evolve as verification progresses and non-conformities are noted. Appendix A provides guidance on the content of the CVP. A CVM template will be provided to the applicant by the CASA Manufacturing Project Officer on request. This CVM will be tailored to the specific project in consultation with the CASA PO.

For complex projects, the CVM may be developed in phase/stage to allow the applicant to raise progressive statements of conformity (Form 724). As verification progresses, non-conformities will be managed via the CVM and extracts of fully completed CVMs (including non-conformities), will be attached to the applicant's statement of conformity and CASA's Conformity Inspection Record (Form 882).

The CVP, including CVM, is approved by CASA Manufacturing.

Conformity Timeframes

- Submission of CVP - Minimum of 4 weeks prior to anticipated onsite verification
- Submission of baselined CVM - Minimum of 2 weeks prior to anticipated onsite verification
- Submission of design data for conformity - Minimum of 2 weeks prior to anticipated onsite verification

Note: Changes made to CVM and design data as a result of CASA review prior to onsite verification, may require an extension to the timeframes listed above.

5.2.2 The conformity verification process

The conformity verification process (Figure 2) consists of two phases:

Phase 1 is CASA's authorisation of the manufacture and installation of the first set of products and addresses the verification of the first or first set of products to be manufactured and installed for the issue of a TC/STC. Noting that there is limited product manufacturing, the focus of Phase 1 is on conformity verification against the authorised design data.

Phase 1 conformity verification is against an approved design. If no further manufacture of products under APMA/PC is intended, only the CVP Phase 1 will be applicable. This phase must be completed before the issue of a TC/STC. The conclusion of Phase 1 is a conformity recommendation to the TC/STC Project Manager.

Phase 2 addresses the verification of further products to be manufactured pending the issue of a PA. Phase 2 is normally used either when the applicant intends to manufacture a limited number of products and will not apply for a PA or foresees a significant delay between the issue of an STC/TC and the start of mass production. Phase 2 is similar to 'production under type certificate only' but with a more structured approach to verification of all products listed in the CVM and a mutually agreed position on 'recommendation' and 'finding' of conformity. During this phase, emphasis will be placed on the identification and management of design changes to ensure that conformity is conducted against an 'approved' baseline. Phase 2 follows on from the design review of Phase 1 and has the additional requirement of manufacturing process conformity.

The conformity verification process - Phase 1

Step 1: The focus of the verification conducted under Phase 1, Step 1 is on conformity against design data; a limited conformity against manufacturing process is conducted for manufacture of the first item (or set) to allow installation for testing and verification. The applicant submits its statement of conformity (Form 724) at the completion of Phase 1, Step 1. The applicant should attach completed extracts of the CVM as supporting evidence when submitting the Form 724 to CASA.

Step 2: is the on-site verification of manufacturing and installation. During this phase CASA will review manufacturing process documentation including traceability of material and specialised processes. Subject to agreements reached during the TC and conformity verification meetings with the applicant, CASA may delegate some inspections to the applicant. The agreements are formally recorded in the CVM under headings of 'recommending' and 'finding' of conformity.

For most major projects where the applicant makes multiple statements of conformity linked to various stages of the project, CASA will also conduct multiple on-site verifications and raise multiple conformity inspection records (Form 882). This is the iterative process shown at Figure 2 before a conformity recommendation is made to the TC/STC Project Manager.

The conformity verification process - Phase 2

Step 1: starts with a review of the current design data baseline with the baseline approved during Phase 1, noting that Phase 2 may lag the completion of Phase 1 considerably, that design may have evolved. The applicant and CASA will also conduct a review of Phase 1 non-conformities at this stage to make sure that these will not prevent further progress to Phase 2. Step 1 is concluded with the applicant submitting a Statement of Conformity to CASA.

Step 2: is the conformity verification of products against the manufacturing processes submitted to CASA to support manufacture beyond the prototype or the product(s) fitted under the TC/STC. For aeronautical products, the step 2 conformity can take the form of a First Article Inspection, the results of which are recorded in the CVP. Step 2 is conducted on-site.

For aircraft, aircraft engines and propellers, step 2 will record the full design and manufacturing processes, including an assessment of the manufacturing capability of the applicant.

For projects that lead into PA, Part 2 includes most of the manufacturing process requirements to be satisfied for the issue of the PA.

The conformity verification process – Project closure

As was the case for Phase 1 of the conformity verification process, there is an iterative process of identifying and correcting non-conformities raised during the applicant's conduct of verification and CASA review and recommendation of conformity. Normally, CASA will expect all non-conformities to be corrected before a TC/STC is issued. However, CASA may proceed with the issue of a TC/STC noting non-conformities as long as these do not impact the airworthiness of the aircraft, aircraft engine, propeller or aeronautical products. When non-conformities are 'carried forward' in a CVM, CASA expects an engineering justification from the applicant.

Once Phase 2 conformity verification is completed, CASA formalises the outcome via a Conformity Inspection Record (Form 882) and the products are released as 'having been

manufactured under a TC'. This release must refer to the record of conformity verification documented in the CVM. Alternatively, the relevant completed CVM sections can be attached to the Form 882.

5.3 Conformity inspection

The conformity inspection process has an emphasis on the inspection requirements for the initial issue of a PA and/or a variation to a PA that is driven by changes of design data and manufacturing processes.

This section provides procedures and methods to be followed by the inspector when conducting inspections to determine that parts, appliances and products (aircraft, aircraft engines, propellers or parts) conform to the approved design drawings and specifications.

Conformity inspection is conducted for any of the following:

- record the inspection of the first article manufactured under an application for an APMA or PC
- record the inspection conducted on production products when there is a change of design or manufacturing processes as a result of a variation to a PA. The variation could be applicable to an APMA or a PC
- record the inspection conducted in relation to ATSOA test articles.

For the variation mentioned above, conformity inspection is required following:

- a change of design affecting form, fit or function of the part
- a change in manufacturing source(s), processes, inspection method(s), location, tooling or materials with the potential of affecting the form, fit or function of the part
- when required as part of a corrective action for a part with repetitive rejection history (typically with three repeat rejections)
- a change in the numerical control program or translation to another media
- a natural or man-made occurrence that may adversely affect the process
- a lapse in production of two years.

For conformity inspection of 'variations', the focus of inspections will be on manufacturing processes because the process of 'develop, review and approve' the new design data is conducted and approved separately.

Once a PA is issued, conformity inspections are conducted to verify that manufacture is in accordance with the manufacturing process approved by CASA.

5.3.1 Depth of conformity inspection

The depth of conformity inspections may vary depending on the particular manufacturer.

In the case of a manufacturer with well-established policies, quality system procedures, experience, inspection personnel, equipment and facilities and who have previously demonstrated first article acceptability, the inspector may choose to reduce the depth of conformity inspection by a form of sampling inspection of the manufacturer’s product and procedures. In the case of a manufacturer whose ability is unknown, such as during the initial production period by a manufacturer producing under a TC only, it will be necessary to

conduct in-depth conformity inspections until the inspector is confident that reducing the degree of assessment will not compromise safety.

For other than initial conformity, statistical quality control methods may be utilised for process evaluation. Complete descriptions of such statistical methods should be documented for observing tests of important functional parameters of systems, modules, components and completed products.

SAE AS9102 – Aerospace First Article Inspection Requirement

The following guidance on conduct of conformity verification/inspection against design data and manufacturing processes are extracted from SAE AS 9102. This document gives the purpose of First Article Inspection as a:

> physical and functional inspection process commonly used to provide objective evidence that all engineering design and specification requirements are properly understood, accounted for, verified and documented'.

SAE AS9102 also states that:

> …the first conforming article is intended to be a ‘standard’ that verifies conformance and one that provides a yardstick for corrective actions and problem resolution.

Guidance for conducting conformity verification/inspection against approved design data

A conformity inspection shall be performed by the applicant and verified by CASA for a new part representative of the first production run including all detail parts and sub-assemblies that constitute the end item ordered. The conformity inspection record is not complete until all non-conformities are resolved.

Note: Prototype parts or parts made using different methods or processes cannot be considered part of the first production run unless full traceability can be shown for the differences between the standard manufacturing processes and the 'unique' part manufacturing process.

The conformity inspection process for a given part initially includes identification of the original source documents and their respective revision status. Purchase orders or equivalent documents must be examined to determine the basic requirements and the validity of the data called up by the customer. Relevant drawings and specifications must be subject to source substantiation to ensure that the current complete data is available for the inspection.

Product conformity is determined by inspecting the processed articles. The manufacturer should make a determination that the process operations are capable of consistently producing articles in conformity with the design requirements. The method used in determining this fact should be measurable, as required by the process specification, and recorded.

Inaccessible characteristics shall be evaluated as early in the process as possible provided they are not affected by subsequent operations. Naturally, tooling used to verify a design characteristic must be qualified by conformity inspection verification back to national standards. Where feasible, conformity inspection measurement equipment and/or personnel should be independent of the equipment or personnel utilised for the final product acceptance inspection. It should be noted that where conformity inspection results are near limits of tolerances, additional parts should be inspected to verify hardware conformance.

The conformity inspection process for a given part initially includes identification of the original source documents and their respective revision status. Purchase orders or equivalent documents must be examined to determine the basic requirements and the validity of the data called up by the customer. Relevant drawings and specifications must be subject to source substantiation to ensure that the current complete data is available for the inspection.

All documented conformity inspection reports are considered a quality record under the CASR record keeping requirements.

CASA MIs may, in order to verify the conformity inspection, keep a record of conformity inspection records and associated objective evidence in the document management system. These records include but are not limited to:

- first article inspection reports
- material/mill certificates
- worksheets or job travellers
- evidence of special processes
- calibration records.

Adequacy of drawings and related change records

Test:

- can the part be produced and inspected using the information on the drawing
- are drawing tolerances practicable and attainable under production conditions? What evidence supports this
- have all of the changes been correctly made to drawings submitted for CASA approval or MRB approval in the case of minor changes? What procedure is used to ensure the incorporation of an engineering change in the production part, on the relevant drawing/s and on completed parts in store
- does the drawing include all the characteristics necessary to inspect the part, the material to be used, the treatment of the material such as hardness, finish and special process specifications
- does the drawing (or associated engineering data) include applicable test specifications?

5.3.2 Guidance for conducting conformity verification/inspection of manufacturing processes

Materials

Tests:

- were raw materials used in the fabrication process in conformity with the design data
- is evidence available to assure that chemical and/or physical properties were identified and checked as appropriate
- is there documented evidence to show traceability from the raw material to the completed part
- are there any parts or process deviations recorded against the submitted design data (including material review dispositions)?

Processes and processing

In evaluating processes, CASA is primarily concerned with performance and conformity. Process performance should be capable of consistently producing articles that meet the specified requirements.

Process conformity is determined by checking the articles being processed to ensure they are in accordance with the process specification and that the materials, tools, and equipment called for are being utilised. Since the end results depend on strict adherence to the process instructions, any deviation or discrepancy should be corrected on the initial runs.

Tests

- is there a process specification for each special process
- has the process specification been submitted for engineering review by CASA
- does a check of the articles processed indicate that the process will produce consistent parts during production in accordance with the type design? Is there statistical or other evidence to indicate this
- is the process being operated in accordance with the process specification? Are any deviations recorded
- are records such as logs, graphs, competency checks of the operators etc available to show conformance to the process specifications?

Automated production processes

Modern production methods involve automatic machines such as milling machines, lathes, riveters, routers, and fabric cutters.

Traditionally, conformity inspection has been against clearly defined type design data, in the form of drawings and specifications. With numeric or computer numeric controlled (NC or CNC) machines, traditional conformity inspections may be difficult due to limited traditional type design data. In such cases, type design data includes the Computer Aided Design (CAD) models or other programmed (software) instructions which can be used to achieve and demonstrate conformity.

CASA must be satisfied that the applicant has the systems and ability to produce conforming parts.

Tests:

- is the approved TD data (drawings, specifications, computer generated models and instructions) permanently stored and available for conformity inspections
- is software used identifiable as to the package and the version
- are computer programs used, such as CAD and Computer Aided Manufacturing (CAM programs, of proven validity)
- have operators of CAD and CAM programs demonstrated competencies in the use of the particular CAD package
- have operators of NC or CNC machines demonstrated competencies in the use of the machine(s)
- are manually-inserted CNC machine instructions related to approved drawings?

NDI method evaluation

The procedure for evaluating an NDI method must provide for the manufacturer to demonstrate to CASA's satisfaction that the NDI method used has the capability to detect the allowable defect size and location specified by the engineering data, that the inspection results are repeatable, and that instruments required to perform the inspection meet the procedural acceptability requirements.

Critical and major characteristics

Tests:

- has the manufacturer identified and inspected all the critical and major characteristics
- does the manufacturer have a record of these inspections
- does witnessing the re-inspection and surveillance indicate that the above inspections were accurate and adequate
- are there any deviations recorded against the approved design data (including material review disposition)?

Workmanship

Tests:

- does workmanship contribute to the safety of the product
- have criteria been established to identify acceptable production techniques and practices?

Adequacy of inspection records

Tests:

- do the inspection records show all inspections that are conducted
- do they show who conducted the inspection
- do they indicate the results of the inspection and disposition of unsatisfactory conditions
- are procedures adequate to ensure re-inspection of any parts that are reworked?

Material review action

Tests:

- is the material review procedure documented and adequate to ensure disposition of non-conformities
- is there adequate corrective action for observed non-conformities to prevent recurrence
- have all considerations been reviewed and recorded for the use of 'Previously Produced Parts', including design evolution, ongoing MRB actions, engineering deviations and waivers?

Software

Tests:

- are all software products, including version description documents, source codes, object codes, documentation, test procedures, loaded hardware/firmware, properly

identified, including revision levels, when compared to the hardware and software engineering drawings
- are there records which indicate that the object code was compiled from released source code by approved procedures
- have all software problem reports been properly dispositioned
- do the records indicate that all software products, including support software and procedures, have been placed under configuration control
- have the verification and acceptance tests been successfully executed to approved test procedures and results recorded? Are there records that indicate that the object code was compiled from released source code by approved procedures
- do records indicate technical acceptance of the software prior to loading into the system or product
- are there any indications of non-compliance with the software manufacturer's procedures
- how is the hardware/software integration managed and how is the hardware ID updated with an update of software
- does the software successfully execute the initialisation procedure?

5.3.3 Conformity inspections of test articles

Prior to initiating conformity inspection activity for test articles, the manufacturer and CASA must establish and document the parameters of the test article configuration and test equipment configuration.

The conformity of the test article and test set-up, such as for static, endurance, operational, pressure, environmental tests, should be established as appropriate to determine conformity.

In all cases, the approved engineering data should include appropriate instructions and reference to the manufacturer's agreed test plan.

When witnessing tests, CASA must determine that the instructions and agreed test plan are followed. Prototype parts or parts made using different methods or processes cannot be considered part of the first production run unless full traceability can be shown for the differences between the standard manufacturing processes and the 'unique' part manufacturing process.

Structural test articles - Aircraft

When conforming structural tests during fabrication and assembly, CASA must ensure that the final design submitted for CASA inspection reflects all changes that have been found necessary as a result of previous tests. CASA must ensure that such changes are incorporated into the production drawings to make sure that subsequent production articles conform to the tested articles.

Products/assemblies destined for structural testing should be clearly identified to make sure that they are not used in production.

Flight test articles - Aircraft

Determining conformity of flight test articles, including system checks, should begin during fabrication. It is important that flight test articles conform to the data specified in the design data on which the manufacturer's statement of conformity is based.

Endurance test articles - Engines and propellers

In addition to conformity of production, endurance test conformity inspections are conducted on aircraft engines and propellers. These tests will be part of the CASA approved specifications.

At the conclusion of the endurance test, during the teardown inspection, CASA should spot-check conformity of major and critical parts by witnessing the manufacturer's inspections, paying particular attention to critical characteristics. Teardown inspection of test articles after endurance testing is a specific requirement of Parts 33 and 35 of CASR. Further details on the conduct of conformity inspection of endurance test are provided at Appendix D.

Submission of Statement of Conformity

Applicants must submit their Statement of Conformity (Form 724) as early as possible in the program to prevent delays in the type certification approval process. Except for 'in-process' evaluations, such as process review and hidden inspections, the Statement of Conformity should be submitted to CASA prior to the start of conformity inspections. The Statement of Conformity should be signed by an authorised person.

In cases where the conformity inspection is conducted away from the applicant's manufacturing facility, the applicant may choose to utilise one of the following procedures for signing the Statement of Conformity:

- the applicant may send an authorised representative to the manufacturer's facility to inspect the prototype article and sign the Statement of Conformity
- the applicant may delegate, in writing, a representative of the supplier to act as their agent. In this case, a copy of the authorisation letter will be attached to the Statement of Conformity when it is submitted.

Appendix A. Conformity Verification Plan

A1 Purpose of the CVP

The CVP must establish clear agreement of who will conduct conformity inspection, what will be conformed, when and where inspections will take place, and how conformity inspections will be recorded and submitted to the relevant authorities. The CVP should focus on:

- verifying the conformity of critical and major characteristics of materials, parts, and assemblies to the approved design data
- evaluating processes to assure production of consistent and uniform products conforming to the approved design data
- recording of non-conformities from the design data and their disposal
- observing tests of important functional parameters of systems, modules, components and completed products.

A2 Amendment process

A brief description of how the CVP will be updated throughout the project to account for design changes, changes of manufacturing processes and changes of inspection requirements.

A3 Contents of CVP

As a guide, a CVP should contain details of the following sections as a minimum:

- **purpose of CVP:** The purpose of the document is to seek CASA acceptance for the conformity inspection process, define responsibilities, set a timeline in support of the project. The document covers aspects of conformity inspection of details parts, assemblies, final assemblies, test set up by the applicant and verification of conduct of conformity by CASA in support of TC/STC for the project
- **review and approval process:** This document will be a dynamic document and will be updated as the project evolves both in terms of authorised design data and manufacturing processes. The document:
  - is owned by the applicant
  - will be regularly reviewed by the applicant and CASA
  - updated (as required) and approved by CASA.
- **associated documents:**
  - Project Certification Plan/Project Definition Plan/Project Compliance Plan
  - CASA Type Certification Procedures Manual
  - CASA Production Approval Procedures Manual
- **general description of the project:** This section will provide a brief description of the project and be extracted from Project Certification Plan/Project Definition Plan
- **brief introduction of the Certification Program:** Key points extracted from the Project Certification Plan/Project Definition Plan

- **responsible persons:** Names and contact details of the key responsible persons from the applicant, engineering organisation, approved suppliers, CASA Certification and CASA Manufacturing with their respective responsibilities listed therein
- **design data used for conformity inspections and control of design data:** Provide a description of the design data and approval status for use in conformity inspection of parts, assemblies, installations or test setups. If there are multiple drawings and documents, reference may be made to a master drawing list. Brief reference should be made as to how the design data will be controlled and how the conformity requirements will be maintained as design data changes
- **manufacturing locations:** List the locations where manufacturing, assembly, installation and testing is proposed to be carried out
- **approval process for suppliers and list of approved suppliers (if any):** List all the suppliers names, location and product/service being provided for the project. If suppliers in other countries are used, an undue burden decision paper will be submitted to CASA. Describe the approval process for suppliers, the conformity process for such parts/services and on-going surveillance
- **incoming material inspections**: List the company procedure for conduct of incoming material inspection, acceptance tests, and acceptable documents relevant to the project
- **tooling inspection and control:** List the company procedure for inspection of tools to provide traceability to the design data, process for regular check/calibration and repair/rework. Alternatively, refer to an existing section of the Quality Manual or the Fabrication/Production Inspection System
- **special processes involved in manufacture and controls exercised:** List the special processes to be used in the manufacture, process qualification, approval of operators and process controls. Alternatively, refer to the Quality Management System and existing section of the Quality Manual or the Fabrication/Production Inspection System
- **applicant conformity/first article inspection of detailed parts:** A brief description of how the parts conformity will be conducted, by whom and when
- **applicant conformity inspection and recording for assemblies:** A brief description of how the conformity will be conducted, by whom and when. Refer to a Conformity Verification Matrix (see Appendix B for example) which lists the conformity inspection required, the sequence of inspections and the authorities for recommending and finding conformance. If inspection records are not fully recorded in the table, provide a brief description of related recording documents, forms to be used for recording the conformity, details to be recorded and retention of those records
- **applicant conformity inspection and recording for major/final assembly/installation:** A brief description of how the conformity will be conducted, by whom, when etc. A brief description of recording documents, forms to be used for recording the conformity, details to be recorded and retention of those records. This should include how the CASA conformity inspection stages will be identified and recorded. The applicant's responsible person for co-ordinating with CASA and the persons responsible to submit Statement of Conformity should be identified

- **test set up conformity:** A brief description of how the conformity will be conducted, by whom and when. A brief description of recording documents, forms to be used for recording the conformity, details to be recorded and retention of those records
- **recording of discrepancies, non-conformities or deviation:** A brief of how the non-conformities observed during conformity inspection will be recorded. Alternatively, refer to an existing section of the Quality Manual or the Fabrication/Production Inspection System
- **disposal process for discrepancies, non-conformities and deviation or MRB process:** Brief description of how non-conforming parts will be discarded or quarantined for rework subject to MRB actions/decisions. Alternatively, refer to an existing section of the Quality Manual or the Fabrication/Production Inspection System
- **CASA conformity tracking by the applicant:** The applicant process for tracking of CASA conformity inspections. This could refer to the conformity verification matrix.

Appendix B. Conformity Verification Matrixes

B1 Conformity Verification Matrix - Sample 1

Table 1: Conformity against Authorised Design Data

Part/Assy No.	Dwg No.	Description	Has the part been previously confirmed? [1]	Proposed Method of Conformity	Dwg issue at date of inspection	Declaration of Conformity to support 724 Signature	Date	Recommending for 882 Signature	Date	Finding for 882 Signature	Date

[1] This column is used to indicate whether the part has been preciously conformed, e.g. - under a previous STC

Appendix C. Conformity Verification Process

C1 CVP flowchart

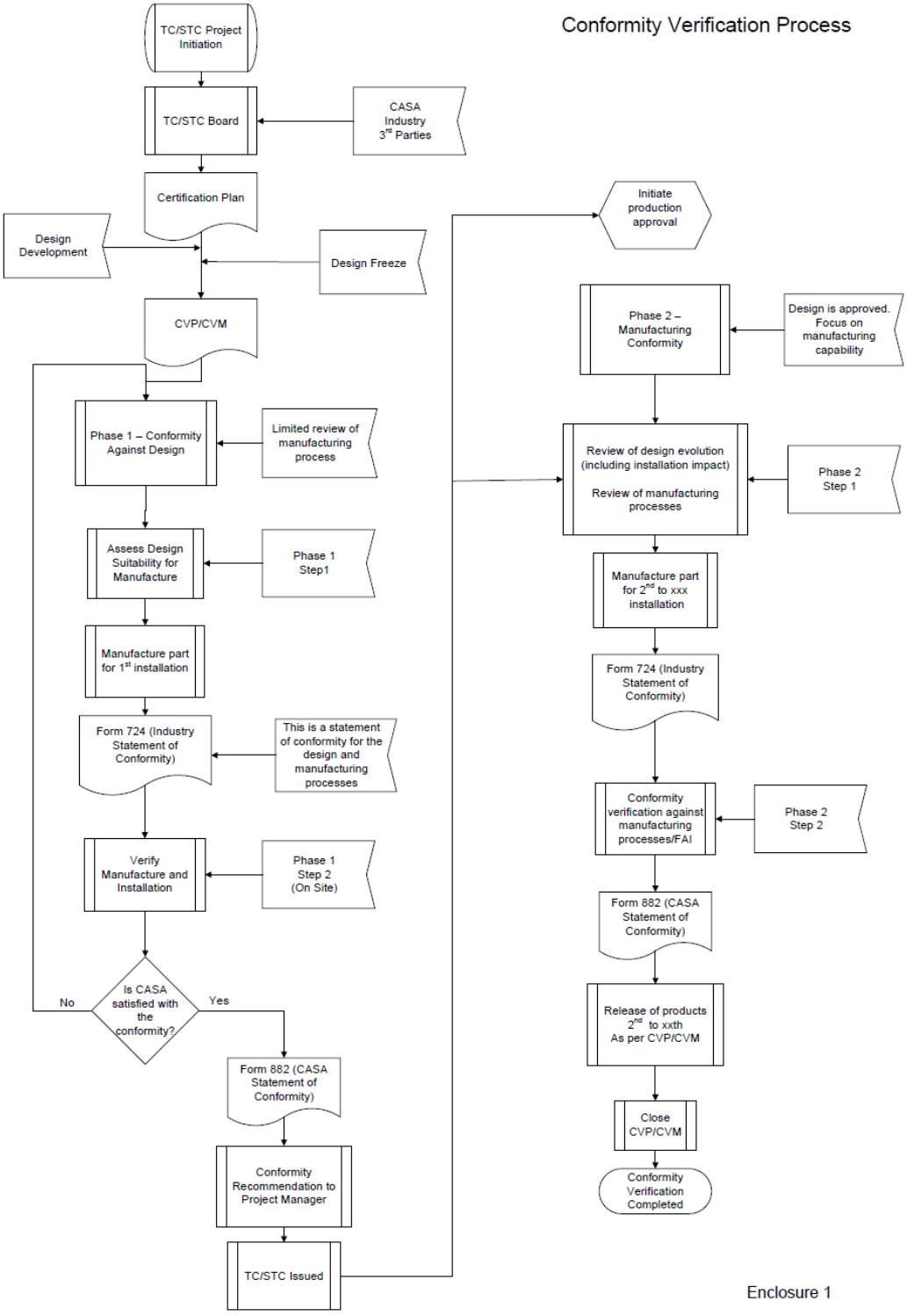


Figure 2: Conformity verification process

Appendix D: Standard Form Recommendation

RMS File Ref:

RMS Doc Ref:

To: Name

Manager D&M

From: Name

Manufacturing Inspector

Subject: XXX Pty Ltd – PA Application – AAA????

References

A. Dxx/xx: Application for PA (Form 849)
B. Dxx/xx: XX Pty Ltd Quality System Manual Rev. xx Dated xx/xx/xxxx
C. Dxx/xx: Draft cover letter
D. Dxx/xx: Draft PA
E. Other as referenced.

Background

Assessment

1) Design Data

2) Stage 1 Quality System Assessment – Desk-top review (PAPM 4.1(1))

3) Stage 2 Quality System Assessment – Quality System Evaluation (PAPM 4.1(2))

4) Stage 3 Quality System Assessment – Manufacturer's Corrective Actions (PAPM 4.1(3))

Recommendation

Reasons for recommending issue:

Manufacturing Inspector

Date:

Agreed/Not Agreed

Decision Rationale and notes:

Manager – Design and Manufacturing

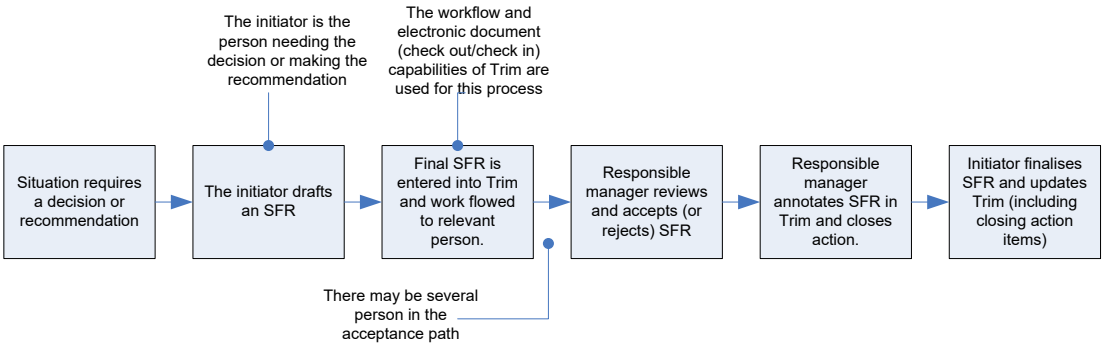
Date:

Action taken.

SFR completed.

Instructions.

The simple workflow for the SFR is as follows:



1. Background

In this section insert brief background information here. Be only as long or short as the complexity of the matter requires.

2. Assessment

In this section insert the technical assessment, logic and decision making discussion here. Again, only be only as long or short as the complexity of the matter requires and if required note any technical attachments here. Make sure you include any peer review information here.

3. References

In this section note any relevant references here particularly electronic references (by hyperlink and include RMS references if applicable). These references may be articles, regulations, existing guidance material, previous recommendations etc.

4. Options

In this section options available to address the issue are noted here in numerical order. By way of example these options may include:

- Producing (or amending) an AD, AWB or other regulatory guidance material,
- Initiating an article for the Flight Safety Magazine
- Initiating a change to a regulation
- Further significant investigation
- Do nothing
- Include in the options any implications you know of or could reasonably foresee. Implications would include not only safety but also political implications).

5. Recommendation

In this section the initiator of the SFR makes a recommendation based on their assessment and experience (and that of the peer review if applicable). They may make more than one recommendation but this would be the exception and not the norm, but it would be the norm to articulate any boundaries or constraints with the recommendation.

6. Reasons for recommending issue:

In this section the initiator notes the reasoning for your recommendation. Again, this is as short or long as the situation dictates.

Agreed/Not Agreed

In this section the decision maker either agrees or otherwise. The decision maker circles their decision if on paper or deletes the incorrect response if electronically. If the agreement or otherwise needs qualification or the delegate/decision maker requires a different action path it is noted here.

Decision Rationale and notes:

In this section the decision maker notes the rationale for their decision and notes any expectations or action items.).

Action taken.

In this section the initiator records what action they have taken in accordance with the directions of the decision maker.

SFR completed.

In this section (if appropriate) the decision maker notes that they have confirmed that the SFR and actions therein are completed to their satisfaction. Any notes here are only as long or as short as the situation dictates.