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Australian Parts Manufacturing Approval

The CASR Part 21 APMA system has lost its similarity with the FAA system that was adopted in 1998. It has now become an atypical public service bureaucratic system that is stifling its use in Australia. With a fleet of legendary aircraft, Australia should be a world leader in the number of APMAs issued by CASA, or, as now available under FAA Order 8110.42C, delegate functions to Part 21J design organisations. Part 21J needs to be based on the FAR Part 183, ODAs to gain benefits and faster responses for industry.

CASR Part 21 has not been updated to include the latest revisions of FAR Part 21 even though CASA told the FAA Bilateral meeting on 21 March 2018 they would amend. 3 years of inaction that has been detrimental to Australia's APMA system.

Where are the government-to-government agreements to accept the Australian PMA products? No agreements, no global trade.

THE 4 WAYS TO OBTAIN A FAA PMA (APMA SHOULD BE THE SAME)

There are four paths to FAA's approval and ultimately gaining PMA and, if Australia ever wants EASA recognition then we need to have the same USA system that is accepted by EASA. EASA is slightly different for some critical parts manufactured items. Australia needs many APMAs for legacy aircraft.

1. SUPPLEMENTAL TYPE CERTIFICATE (STC)

Typically, approval of major changes in type design of an aircraft is obtained in the form of an STC. To gain PMA through a current holder of a STC is the path of least resistance. Since parts are already designed and approved, the FAA just verify the manufacturing capabilities to produce these parts to the FAA-approved design certificate.

But what if PMA holder doesn't own the STC?

2. LICENSING AGREEMENT

On occasion, a manufacturer obtains a PMA using the design data from another company who owns an STC for the part they want to manufacture. The PMA holder enters into a license agreement to manufacture the parts with their PMA capabilities is in accordance to the STC holders approved design data.

3. IDENTICALITY

On occasion, the original design data may not be available to produce the part. Therefore, the PMA holder can design a replacement part and show that their design and manufacturing capabilities will produce the part identical to the original approved part, this pathway can obtain the PMA based on identicality. The PMA holder efforts through ***Identicality*** must prove their design and produced parts is identical in all aspects, including function, dimensions, materials, etc. **The *advantage to PMA by Identicality* is that the certification and approval process is much less involved than by Test and Computation, but in most instances, it is difficult to prove identicality.**

4. TEST AND COMPUTATION

If an applicant cannot show Identicality, they can still obtain PMA by Test and Computation. In this case they are creating and presenting new design data similar to, but not exact or identical to the original design. They must substantiate their design through test and/or computation methods, similar to an STC. To test parts they are put through the paces under different conditions to show the new design data is airworthy and in compliance to the regulations. **Computation is accomplished through examination of the design through research and statistical analysis.**

CASR Part 21 is dated and not as efficient as the FAR Part 21 it is based on. It supports a Bilateral Aviation Safety Agreement with harmonisation capabilities with the USA and those functions could be expanded further is CASR Part 21 is kept harmonised with FAR Part 21.

The FAA system is quite straightforward, it uses industry delegates & design orgs more than our current system. The use of industry has seen approvals being given in a timely manner.

"To reduce FAA time, the design and manufacturing data can be approved by industry delegates (DERs)".

The approval methods that apply to a lot of the PMAs is the Test and Computation or Identicality process. ACO design approval accepted, manufacturing accepted, production approval issued followed by PMA being issued.

As can be seen by the FAA flowchart, a common method that is used is the ***Test & Computation*** Method.

Another less common method is the ***Identicality*** Method.

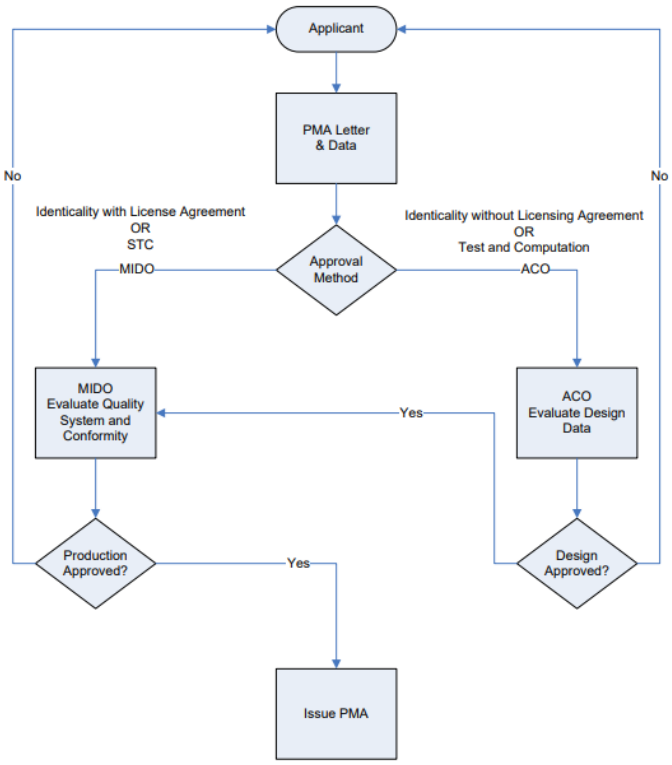
The first step is to have the design data approved and the second step is to then have the manufacturing capability approved.

Depending on the risk assessment by the FAA, the level of involvement by the FAA is then determined.

High level of risk is normally associated with critical or lifed parts whereas low and medium levels utilise industry delegates (e.g. 21J design org or 21M authorised person).

The majority of potential APMAs in Australia would be low and medium that should reduce CASA involvement by utilising the Part 21J design organisation and 21M authorised person. If the applicant already has manufacturing approval, then adding parts to their approval is basically an administrative process.

Figure A-1. PMA Process



Use of CASR Part 21J Design Organisations & 21M Authorised Professional Engineers

CASA should be making extensive use of industry delegates in the same manner as the FAA uses Part 183 engineering representatives and ODAs. This was the whole purpose of adopting FAR Part 21 in the first place.

Shift the responsibility for approving the data to industry rather than retain that responsibility within a government agency. Industry engineering remains more current with the advancements made in the aviation field than those within government.

Government policy

What is required is government policy to fully adopt ***FAR Part 21 Certification Procedures for Products and Articles*** and to remain harmonised with this FAR Part so our designs of products and articles, and the parts manufacture can be recognised in their own right with countries the government obtains agreements with.

Maybe Government should take more responsibility for amending CASR Part 21.

Figure 1. Roles of FAA and Applicant in PMA Process

Applicants	FAA Design Approval	FAA Manufacturing Approval
• Show that the design meets the applicable airworthiness standards by either of the following two ways: (1) Showing that the PMA part's design is identical to the design of a part that is covered under a TC, or (2) Using test and computation that shows the PMA part's design meets the airworthiness requirements that apply to the affected product. • Set installation eligibility. • Ensure the part performs its intended function. • Provide a plan for continued operational safety (COS). • Determine part criticality by assessing the consequences of PMA part failure on the next higher assembly and associated product. • Provide instructions for continued airworthiness (ICA) for the PMA part or product as necessary. • Set up and maintain a FIS to meet the requirements of 14 CFR § 21.303(h). • Report service difficulties. • Draft a PSCP **if applicable**.	• Ensure compliance with agency regulations, programs, standards, and procedures on issuing design approval for replacement and modification parts. • Coordinate and participate in developing a PSCP as needed. • Investigate service difficulties. • Witness **or delegate various functions.** • Review COS plan. • Coordinate with aircraft evaluation group (AEG) for ICA review as needed. • Notify applicant of design approval. • Forward application package to the MIDO after design approval.	• Process PMA applications based on license agreements and STCs. • Ensure conformity to the approved design. • Issue PMA supplements after design approval and FIS validation. • Accept FIS. • Investigate service difficulties • Issue the FAA-PMA production approval letter. • Conduct surveillance at the PMA holder's and supplier's facilities, both foreign and domestic. • Investigate and submit enforcement reports when PMA holders and non-PMA holders do not comply with 14 CFR.

However, the FAA Order 8110.119 also specifies "a streamlined process that entails the FAA receiving a uniform data package that relies on PMA holder showings and statements of compliance. Guidance for this process is in the *Modification and Replacement Parts Association (MARPA) Document 1100, Streamlined Program for PMA Applications of Non-Safety Significant Articles Submitted by Experienced Applicants with a Qualifying Performance Record*. MARPA makes this document readily available to the public on its website at www.pmaparts.org .

(I) Review the applicant's characterization of each article and the impact of its fai**lure. The applicant's safety assessment must show the article is non-safety significant and its failure has little or no effect on continued safe flight and landing.** Use safety standards appropriate to your product. If you concur with the applicant's assessment, accept the article into the streamlined process. If the safety assessment is inadequate or the article's failure affects safety, direct the applicant use the PMA process in Order 8110.42."

The comparison how this FAA system is working in the USA and Australia clearly identifies how out-dated FAA system is working in Australia. CASR Part 21 clearly identifies that the Australian system is not the cost-effective safe system used in the USA.

Bureaucracy has always been the reason aviation fluctuates in Australia because they work against delegating functions to industry approved organisations and individuals.

FAA Order 8110.42C. Chapter 5. Designated Engineering Representatives (DER) and Organization Designation Authorization (ODA)

"DER Roles in the PMA Process. We at the FAA or **our organizational designees** [*CASR 21J*] **have authority to approve PMAs**. DERs [*CASR 21M*] do not approve PMAs, but support the FAA approval process with findings within their limitations. The PMA process entails findings of design acceptability through identicality or test and computation. Note that the FAA reserves the approvals of certain *aspects of critical parts regardless of the PMA basis*. A DER [*CASR 21M*] may only recommend approval within the scope of their authority for these parts. 'Also, ODA [*CASR 21J*] units have nearly the same responsibilities and authorities for approving the design of replacement parts as FAA ACO personnel.'"

The FAA extensively uses delegates in the Test & Computation Process.

It's time that the same process is duplicated in Australia.

Do we have to wait for the next FAA-CASA Bilateral Meeting to discover that the FAA stops recognising the Australian version of FAR Part21.

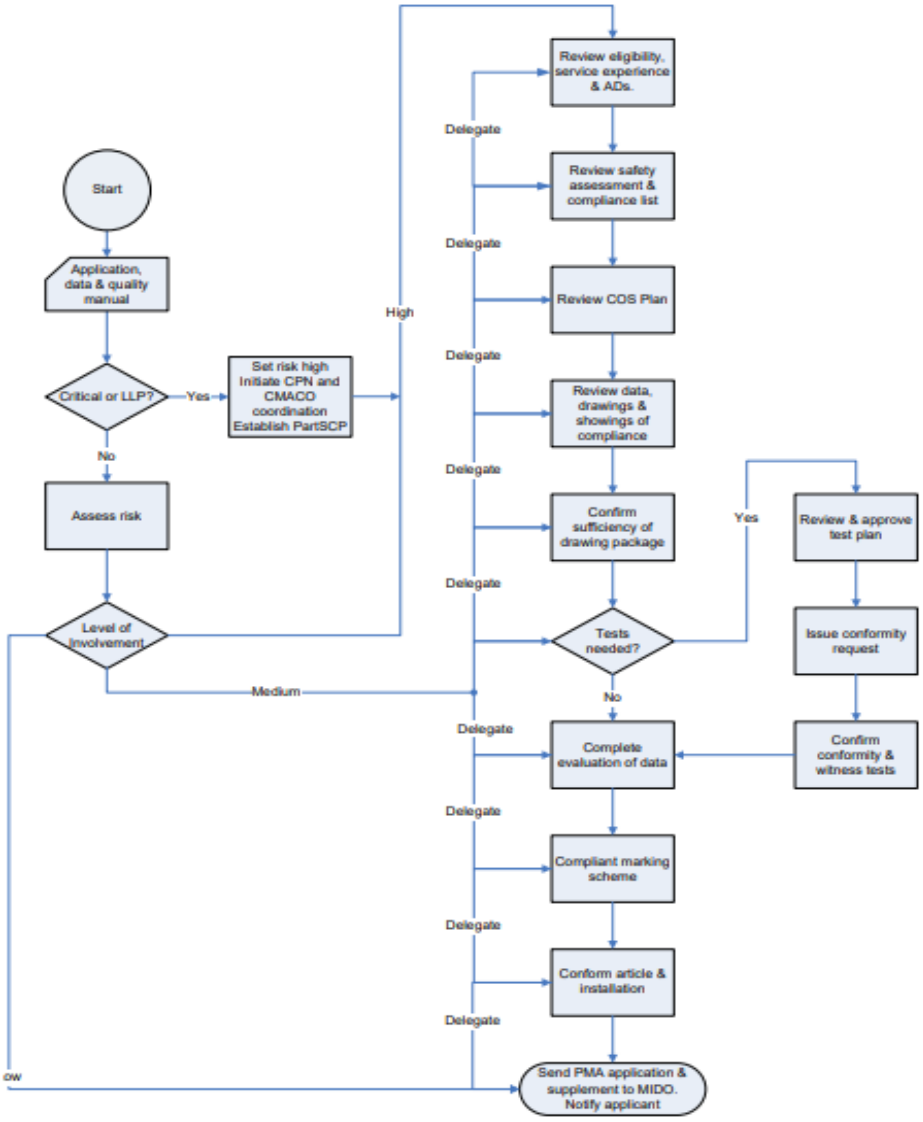
CASA told them last time that CASR Part 21 will be amended.

CASR Part 21 is dated and should have been replaced by FAR Part 21 when it was amended over a decade ago.

The basic PMA steps are:

- Submittal of PSCP
- First Article Conformity
- Test Plan submittal to FAA
- Test Plan approval
- Testing completed
- Test Report submittal to FAA
- DER approved 8110-3 reports/drawings
- Final data submittal for PMA completion
- Issuance of engineering design approval
- Addition milestones as appropriate

Figure A-2. PMA Process for Tests & Computations



For aviation engineering to achieve global recognition will be test of this or future government's character. *Government/businesses with good intentions make promises but governments/businesses with good character keep their promises.*