

Revitalisation Proposals – Australia’s General Aviation Sectors - 2015

Proposal 2: Ageing Aircraft Fleet

General

Aviation regulatory changes that have been implemented since 1988 have singularly and collectively applied a regulatory and administrative system that has financially and organisationally obstructed the viability of general aviation. The outcome of these changes over this period is that general aviation is no longer sustainable under the current and proposed regulatory system.

The regulatory changes applied during the early 1990s changed general aviation maintenance personnel responsibilities, maintenance standards and legislative and regulatory minimum aircraft maintenance standards in the non-airline sectors. At the time, many in the maintenance industry and those employed in the Authority highlighted the risks of these changes. More were against the change than for it. Today’s concerns with ageing aircraft is a direct result of these changes.

If the right regulatory environment exists, the monitoring, by visual inspection to the proper inspection criteria, of the airworthiness and serviceability of aircraft in general aviation would be part of the normal inspection processes similar to what existed prior to regulatory reform that started in the late 1980s.

In particular, regulatory changes have altered general aviation maintenance philosophies so that aircraft are no longer ‘inspected’ to determine they are ‘airworthy’ and complied with certification *airworthiness requirements* but restricted to perform maintenance (inspection) in accordance with “approved” maintenance data. A total removal from requirements to ensure aircraft continue to comply with applicable airworthiness requirements.

This is not the airworthy inspection and maintenance philosophy depicted in the ICAO Annex Standards and Recommended Practices or the Federal Aviation Regulatory System that should be the basis for maintaining Federal Aviation Administration (FAA) type certificated aircraft. The majority of the general aviation aircraft fleet are still FAA type certificated aircraft.

In hindsight, those changes have created inferior regulatory inspection and maintenance standards for general aviation than those used by the National Aviation Authority (NAA) that certified the aircraft – predominately, the FAA. Pre 1990s, maintenance personnel and aircraft maintenance standards were more ICAO compliant and, to a greater extent, harmonised with the Federal Aviation Regulations (FAR).

The alignment with and, in some places, exceeding the FARs standards and practices were done for a purpose that still exists. The vast majority of general aviation aircraft have been certified by the FAA and therefore the FAA minimum airworthy and maintenance standards should be the minimum adopted standards.

In hindsight, add to these untenable regulatory changes in the 1990s, the EASA ‘experiment’ of the 2000s that were rejected by most in general aviation when they were first proposed, has only added costs to these sectors, and CASA, of millions of dollars for a failed outcome – general aviation has not prospered under this system nor has safety been improved.

In general aviation, experienced licenced aircraft maintenance engineers still, thankfully, apply maintenance practices and attitudes of the past when performing inspections. The safety levels in general aviation has been reliant on these licenced aircraft maintenance engineers, not on current regulatory requirements.

One of the purposes of regulatory reform started back in the late 1980s was to reduce unique Australian requirements and adopt the country of design requirements for the continuing airworthiness of aircraft manufactured by other mature aviation countries.

However, some of the unique changes to the maintenance philosophies introduced in that period have failed general aviation; past requirements need to be re-applied with some updates. International inspection criteria has been written out of the requirements.

To understand general aviation inspection and maintenance standards there is a need to understand the consequential requirements of the NAA type aircraft and/or product design certification approval. This fact is explained in this proposal.

In addition, in the US, research into ageing aircraft and new fatigue analysis has seen aircraft manufacturers, especially those with liability experience and suspicions, develop additional recommended inspection and maintenance requirements. However, aircraft manufacturer developed special or supplemental inspection requirements are, under the certification process, only recommended requirements unless included in the NAA approved airworthiness limitations section of the manufacturer's maintenance manual. (FAA regulatory term is 'instructions for continuing airworthiness').

Some manufacturer developed special inspections do become regulatory mandatory – they are developed in conjunction with the certification personnel from the NAA responsible for type design and included as Airworthiness Limitations. Though Special Inspection Requirements for the Cessna aircraft will be discussed in Proposal 3, the following statement refers to the Cessna SIDs but also applies to other aircraft manufacturer's supplemental inspection/maintenance requirements.

SID is a manufacturer's "Special Inspection Document" which details certain inspection requirements that are outside the regular recommended scheduled maintenance inspection intervals. Cessna has published SIDs for its 100/200 series aircraft. These SIDs are not included in the "airworthiness limitations" sections of the Cessna Instructions for Continuing Airworthiness (ICA), and are not, currently, subject to any FAA Airworthiness Directives.

Therefore, Cessna SIDs for 100/200 series are not FAA specified mandatory inspections, in the USA from a regulatory point of view, even though they may be designated "mandatory" by Cessna. What this means is compliance with SIDs for Cessna series aircraft is recommended.

However, amendment action is required to change the Australian aviation regulatory and administrative system to apply the same requirements in Australia as specified in the FARs.

This proposal supports adoption of the FAA approach to ageing general aviation aircraft and, along with other AMROBA Proposals and Recommendations, enhance general aviation with the same safety standards and levels that have been achieved in the US.

There is now a real urgency to progress these industry recommended regulatory and administrative changes to halt the crumbling general aviation industry that is nobly attempting to operate under this confusing and unsustainable system.

Proposal 1 must be read in conjunction with this proposal.

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Airworthiness and Maintenance International Standards

Since regulatory changes that were made in 1991, Australia's obligations under the Convention Annexes have been ignored because history of our aviation regulatory system has not been understood. Two aspects associated with maintaining an aircraft airworthy and serviceable, one under Annex 6 and the other under Annex 8 are obviously no longer understood by those responsible for meeting international obligations.

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The repealing of the 3 year major inspection removed the Annex 8 obligation from Australia's aviation requirements, something that has not been done by the FAA who are responsible for the aircraft type certificates that make up the majority of general aviation aircraft.

After two decades, the basic principles of ICAO Annex 6 and 8, as they relate to basic principles for inspecting the aircraft's airworthy condition and maintenance standards to keep aircraft serviceable, are not understood by most.

Pre 1991, CAO 100.5.1 clearly defined the difference between the 'periodic' maintenance inspection and the 3 year major inspection. Basically, the 'periodic' (FAA 100hourly) is what US aircraft manufacturers' deem "**routine**" maintenance and the "3 year major" is deemed by US manufacturers as "**detailed**" inspection/maintenance. The CAO similarly clarified the "periodic" by stating "*this inspection may be performed without major disassembly*" just like "*routine inspection/maintenance*" is defined by US aircraft manufacturers. The 3 year major inspection however, stated an "inspection of such magnitude that the LAME in each category could **certify as airworthy until the next major inspection**", whereas the US manufacturers define this as "detailed inspection/maintenance", that is, their "annual inspection".

Instead of repealing the major inspection, the uniquely Australian requirement "*until next major inspection*" (3 years) should have been repealed as it was an impossible expectation because one can only certify as airworthy at the time of the inspection. It was this clause that caused such distrust by aircraft owners as some major inspections were perceived to have gone too far to meet this 3 year requirement. However, this contentious provision has been retained in CAR Schedule 6 today. It is not in FARs or ICAO.

The 3 yearly airworthy inspections were adopted in preference to having a yearly renewal of the certificate of airworthiness – Annex 8 actually required the annual inspection to replace the annual renewable certificate of airworthiness inspection – the FAA has maintained an 'annual inspection' for this purpose but the 1991 amendments to the CARs repealed this 3 year inspection. Since then we have not had an inspection to certify the aircraft as airworthy.

In addition to this inspection there is a need for each aircraft to have a maintenance schedule to keep the aircraft serviceable whenever it is intended to be flown. This requirement is contained in ICAO Annex 6 and is covered by the CASA Maintenance Schedule or the manufacturer's maintenance schedule.

If there is any concern with airworthiness or maintenance standards in general aviation then the amendments to airworthiness and maintenance requirements have created an environment where such concerns can develop.

This proposal recommends the introduction a proper inspection regime for general aviation to eliminate the need for CASA to mandate manufacturer "recommended" requirements or to raise airworthiness directives that emanate from a below standard inspection criteria.

International Obligations

Annex 8 states that Australia shall:

- 3.2.3 A Certificate of Airworthiness **shall be renewed** or shall remain valid, subject to the laws of the State of Registry, provided that the State of Registry shall require that the continuing airworthiness of the aircraft shall be determined by a periodical inspection at appropriate intervals having regard to lapse of time and type of service or, alternatively, by means of a **system of inspection**, approved by the State, that will produce at least an equivalent result.

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Australia last met this requirement for Class B aircraft pre 1991 when the 3 year major inspection to certify the aircraft as airworthy was repealed. The Authority, when it repealed the annual Certificate of Airworthiness Inspection carried out by the Authority, replaced it with the 3 year major inspection for general aviation aircraft. Aircraft that had an approved system of maintenance were exempt from the 3 year major because the “detailed airworthy inspection” became part of the system of maintenance. A good example of combining both aspects are seen in manufacturer’s ‘progressive maintenance programs’.

- 3.2.1 A Certificate of Airworthiness shall be issued by a Contracting State on the basis of satisfactory evidence that the aircraft complies with the design aspects of the appropriate airworthiness requirements.
- c) develop or adopt requirements to ensure the continuing airworthiness of the aircraft during its service life, including requirements to ensure that the aircraft:
- i) continues to comply with the appropriate airworthiness requirements after a modification, a repair or the installation of a replacement part; and
 - ii) is maintained in an airworthy condition and in compliance with the maintenance requirements of Annex 6, and where applicable, Parts III, IV and V of this Annex;

Certification by a LAME that the aircraft conforms with “airworthiness requirements” initially and post modification, repair or installation of replacement part in the aircraft maintenance records complies with international standards. It is why Australian aircraft maintenance records are quite often seen as deficient when an aircraft is sold off-shore.

Conversely, Annex 6 places the responsibility on the registered operator to maintain the aircraft in an airworthy condition. In other words, the registered operator must comply with CASA’s, or the manufacturer’s, maintenance schedule or include the maintenance and airworthy inspections (detailed inspection) into an approved system of maintenance. Some aircraft manufacturers have provided a progressive maintenance program that has combined both inspections.

Annex 6 places the responsibility to maintain aircraft in an airworthy condition on registered operators.

8.1.1 The owner of an aeroplane, or in the case where it is leased, the lessee, shall ensure that:

- a) the aeroplane is maintained in an airworthy condition;*

This ICAO requirement to maintain an aircraft as airworthy at all times is not in the Australian system. We might do it for motor vehicles but not aircraft.

Australia has used the FAR operational rule approach to aircraft on its register but not the FAR airworthiness and maintenance requirements:

§ 91.7 Civil aircraft airworthiness.

- (a) No person may operate a civil aircraft unless it is in an airworthy condition.*

The aircraft may sit in a hangar for years with no flying hours and then have a maintenance release inspection carried out and the aircraft is back in service. There is no CASA standard that would require such an aircraft to be disassembled to determine the aircraft and/or systems as airworthy.

Aircraft Maintenance Standards

To address causal issues that may affect the airworthiness and maintenance standards of the general aviation aircraft fleet, there is a need to look back at the system that operated prior to regulatory, airworthiness and maintenance philosophies changes in 1991 when primary airframe structures were inspected to a greater depth than today.

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Pre 1991, both a definitive *3 year major airworthy inspection* and a *periodic maintenance inspection* existed. The major inspection was repealed and the periodic inspection standard was retained but the periodic inspection that was retained does not require a “*detailed inspection*” to the same level as the major airworthy inspection or the annual/100 hourly inspection requirements used for the same aircraft under the FARs.

In AMROBA’s opinion, the 1991 changes are the causal reason for any perceived problems with the condition of an ageing aircraft fleet – it is not the maintenance industry that is the causal reason for suspect aircraft deterioration, it is the regulatory requirements – these issues have been raised with CASA in the past.

The repeal of the “3 year major” removed the inspection to verify the aircraft and systems continued to be airworthy and the aircraft continued to comply with its applicable airworthiness requirements. A periodic maintenance inspection does not meet this requirement, a periodic inspection is for the purpose of serviceability.

Therefore, the real issue confronting general aviation is that the current regulatory environment introduced in the early 1990s and many subsequent changes are deficient, lack clarity and are not harmonised with those applied by the NAA responsible for the majority of aircraft types operating in general aviation.

Where is the current regulatory requirement for the LAME to inspect aircraft structures and systems as airworthy and to ensure that the aircraft and systems continue to meet the applicable airworthiness requirements?

“**Airworthiness Requirements**” are mostly contained in FAR Part 23 for these aircraft.

The 1991 changes introduced long term fundamentally lower regulatory airworthiness and maintenance standards – it is the regulatory ‘inspection’ standards that need fixing urgently to address the ageing general aviation aircraft fleet on-going inspection criteria.

To do this, there needs to be a better understanding how the Federal Aviation Regulations (FAR) meet the ICAO Annex requirements that are appropriate to aircraft continuing airworthy inspections and on-going maintenance requirements.

To understand these FAR requirements there also has to be an understanding of the principles of developing Instructions for Continuing Airworthiness by the manufacturer – i.e. “recommended” ‘maintenance instructions’ usually promulgated in the manufacturer’s maintenance manual. Under FAR Part 23, these instructions are normally based on an aircraft utilisation of between 200 & 300 flight hours per annum.

In Australia, low utilisation of aircraft in the general aviation aircraft fleet is another causal issue that has to be taken into account.

The vast majority of Australia’s general aviation fleet are Federal Aviation Administration (FAA) type certificated aircraft. Therefore it makes good sense to adopt as close as possible the same on-going inspection and maintenance requirements applied in the United States to keeping these aircraft flying safely. The intricacies of the Federal Aviation Regulations (FAR), has to be properly understood to realise the importance, and reliance, on inspection & maintenance personnel to certify aircraft as airworthy, much like LAMEs did pre 1991.

The periodic maintenance schedule, CASA’s or manufacturers, meet the maintenance standards that have their origin in Annex 6.

The pre 1991 3 year major inspection replaced the annual renewal of the certificate of airworthiness inspection that was carried out by Authority personnel. The origin of this inspection can be found in ICAO Annex 8.

Airworthiness Requirements

The FAR Part 23 ‘*airworthiness requirement*’ placed on the manufacturer (type design holder) to provide ‘*recommended inspection and maintenance instructions*’, including a *recommended inspection and maintenance schedule*, does not mean the manufacturer’s “maintenance instructions” are mandatory unless the NAA “approves” them as part of the airworthiness limitations or mandates that they be used in Regulations, e.g. Airworthiness Directive.

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FAR 23.1529 Instructions for Continued Airworthiness.

*The applicant must prepare Instructions for Continued Airworthiness in accordance with **appendix G** to this part that are acceptable to the Administrator. The instructions may be incomplete at type certification if a program exists to ensure their completion prior to delivery of the first airplane or issuance of a standard certificate of airworthiness, whichever occurs later.*

Appendix G is discussed in detail in a later section – ***Aircraft Certification Standards***.

To ensure the aircraft type certificate holder, normally the manufacturer, fulfil this on-going continuing airworthiness responsibility worldwide, Australia should adopt their airworthiness and maintenance requirements when their aircraft is registered in Australia.

Clarify Maintenance Schedules

The current CASA maintenance schedule, or the manufacturer maintenance schedule for Part 23 aircraft, are discussed in detail in this proposal but little is explained in our system regarding the use of manufacturer’s progressive maintenance systems that includes the Annex 8 airworthy inspection [detailed inspection/maintenance aspects]. The progressive inspection removes the need for the FAA “annual inspection”.

This further highlights the problem that the CASA maintenance schedule does not differentiate between routine and detailed inspections. In fact, CAAP 42B-1 only requires a “general condition” inspection. These CASA endorsed inspection standards will not provide the same safety levels as is applied in the country of manufacture.

Recommendation – Aircraft Maintenance Standards

To provide as close as possible airworthiness and maintenance standards as those that are applied by the FAA, it is therefore recommended the adoption of the FAR system of aircraft “inspection” requirements under FAR Part 91.409, including FAR Part 43, especially the performance regulations contained in FAR Part 43.

This includes the adoption of the FAA “annual inspection” that is discussed in detail later in this proposal. The inspection is normally carried out in conjunction with the elected maintenance schedule.

CASA Maintenance Schedule

The CASA maintenance schedule is not the same as the FAA “annual inspection” nor is it equivalent to the FAA periodic inspection, it is more like a generic manufacturers’ maintenance schedule.

The US manufacturers’ maintenance schedules are also not the FAR “annual or periodic inspection”. Part 91 operators must comply with the mandatory FAR “annual inspection” and, in specified operations, must also comply with the FAR periodic inspection. The manufacturers recommended maintenance schedules do not apply to Part 91 operators.

Unless the CASA Maintenance Schedule is focused on more “detailed inspection” annually, then on-going ageing aircraft issues will continue to become evident.

The CASA maintenance schedule does provide an option to the manufacturer’s maintenance schedule and, for a large number of aircraft, is a better maintenance schedule than the manufacturers. The areas of maintenance are formatted based on the CAR 31 AME licencing categories associated with the maintenance tasks.

However, CASA has applied questionable maintenance standards to their own Schedule.

The CASA Maintenance Schedule states:

*2.7 Unless otherwise indicated in the table, where the table requires a thing to be inspected, the inspection is to be a **thorough check** made to determine whether the **thing** will continue to be airworthy **until the next periodic inspection**.*

So what is a ‘**thorough check**’? Is it a routine inspection with no disassembly or a detailed inspection with disassembly as necessary? “Routine & Detailed inspection are international aviation terms used in most manufacturer’s manuals whereas “thorough check” is not. How can anyone guarantee that the “**thing**” will continue to be safe for flight for 12 months?

Once again, inclusion of an impossible provision that can never be met by the LAME certifying the inspection.

However, CASA’s CAAP 42B-1 – CASA Maintenance Schedule provides conflicting explanatory advice. Obviously, according to the CAAP, a “*thorough check*” is a “*general condition*” inspection; as the CAAP explains:

*6.4 **All items are to be inspected for GENERAL CONDITION** together with specific requirements where nominated.*

*6.5 The term **GENERAL CONDITION** includes, but is not limited to, the following:*

- *correct operation, full and free movement in the correct sense;*
- *correct rigging, alignment and tension;*
- *appropriate lubrication;*
- *correct fluid quantities or levels;*
- *correct air and/or nitrogen pressures;*
- *security, cleanliness;*
- *wear is within acceptable limits;*
- *no loose or missing fasteners;*
- *vents are free from obstruction;*
- *correct clearance;*
- *bonding straps correctly positioned, undamaged and secure;*
- *freedom from excessive:*
 - *leakage;*
 - *corrosion, deterioration of protective treatments;*
 - *cracking and disbonds;*
 - *deformation, wear, scoring, chafing, flat spots and fraying;*
 - *obstruction or other obvious damage; or*
 - *burning, arcing or heat damage; and*
- *that hoses are within inspection and testing periods.*

As long as there is freedom for excessive???? Who determines the standard????

This infers that CASA permits some level of *leakage, corrosion, deterioration of protective treatments; cracking and disbonds; deformation, wear, scoring, chafing, flat spots and fraying; obstruction or other obvious damage; or burning, arcing or heat damage.*

Nothing in this CAAP requires the aircraft to be disassembled, as necessary, to determine the aircraft or aircraft system as airworthy.

The CASA Maintenance Schedule is exactly what it states, a maintenance schedule that does not require an inspection to determine the aircraft as airworthy and continuing to meet the applicable airworthiness requirements.

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There is no on-going inspection criteria to ensure the aircraft still complies with its design airworthiness requirements in the current system. e.g. the Annex 8 ex 3 year major inspection or the FAR annual inspection.

The lack of airworthy certifications in aircraft maintenance records is one reason why Australian aircraft maintenance records are seen as deficient globally.

Recommendation – Maintenance Schedule:

1. That CAAP 42B-1 be removed, amended, in collaboration with industry association representatives, to include clear, internationally accepted airworthiness and maintenance standards of inspection to be applied during the CASA Maintenance Schedule.
 - This can be achieved by adopting US manufacturer definitions of ‘routine’ and ‘detailed’ inspections contained in their maintenance manuals and then apply them to the CASA Maintenance Schedule.
 - Routine inspections do not require disassembly whereas detailed inspections require disassembly as necessary to complete the inspection.
2. It is strongly recommended that this can be achieved in the short term by replacing paragraph 2.7 in the CASA Maintenance Schedule with similar words from the FAA system, as follows:

2.7 Unless otherwise indicated in the table, where the table is used for either a 100 hourly inspection or a periodic (annual) inspection, the following criteria applies.

- **100 hourly Inspection – Is a routine inspection consisting of visual examination or check of the appliances, the aircraft, and its components and systems, insofar as practicable without disassembly.**
- **Annual Inspection – Is a detailed inspection consisting of a thorough examination of the appliances, the aircraft, and its components and systems, with such disassembly as is necessary to certify the aircraft or system as airworthy.**

Explanation

The need to include the “disassembly as is necessary” is extremely important. The same philosophies applies to the performance of an “annual inspection” in the FAR system.

If the LAME performing the inspection is familiar with the aircraft by performing previous “annual inspections” on the same aircraft, then the LAME can use his/her experience and familiarity with the particular aircraft to determine the depth of disassembly required at each annual inspection.

For instance, if the aircraft has not been inspected previously by the LAME, then disassembly must be thorough to identify a base line for the aircraft. After setting the base line, the depth should depend on utilisation, operational environment, etc. that the LAME takes into account. Like all aircraft, full inspection should be accomplished in a two year cycle. However, a low utilisation aircraft could expand the full inspection over a three year cycle.

Like the annual inspection in the US, owners are encouraged to keep their aircraft with the same IA (LAME/AMO) instead of shopping for the cheapest quote. There are financial savings and safety benefits by remaining with the one LAME/AMO.

Aircraft Annual Inspection

There needs to be a better understanding of what an ‘annual inspection’ is and what the LAME performing the inspection is required to certify as airworthy. To understand the FAA approach to the mandatory annual inspection is to understand the philosophies of Annex 8 where it states that Australia should:

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3.2.3 A Certificate of Airworthiness *shall be renewed or shall remain valid, subject to the laws of the State of Registry, provided that the State of Registry shall require that the continuing airworthiness of the aircraft shall be determined by a periodical inspection at appropriate intervals [3-year major that was repealed]* having regard to lapse of time and type of service or, alternatively, by means of a system of inspection, approved by the State, that will produce at least an equivalent result.

3.2.1 A Certificate of Airworthiness shall be issued by a Contracting State on the basis of satisfactory evidence that the aircraft complies with the design aspects of the appropriate airworthiness requirements.

c) develop or adopt requirements to ensure the continuing airworthiness of the aircraft during its service life, including requirements to ensure that the aircraft:

- i) continues to comply with the appropriate airworthiness requirements after a modification, a repair or the installation of a replacement part; and
- ii) is maintained in an airworthy condition and in compliance with the maintenance requirements of Annex 6, and where applicable, Parts III, IV and V of this Annex;

Previously, this proposal has discussed amendments to CASA’s Maintenance Schedule that would apply international standards for an annual inspection with disassembly to the depth necessary so that the LAME can certify the aircraft as airworthy.

The word “airworthy” has two basic connotations in aircraft maintenance that is important to be reflected in aircraft maintenance records, especially if the aircraft is to be sold off-shore to countries like America and Canada.

The first is maintenance certifications that confirm that the aircraft meets the requirements for a certificate of airworthiness and continuing LAME certifications that certify that the aircraft continues to conform with the “airworthiness requirements” [design data], especially post each modification, repair or replacement item; i.e. the aircraft conforms to approved design data. This is the evidence trail that has been missing from general aviation maintenance records since 1991 and has caused some pain to owners when the aircraft was sold off-shore.

The second is maintenance certifications that the aircraft is safe to fly – this is generally understood in general aviation as a certification on the maintenance release or a clearing endorsement on the maintenance release.

Recommendation – Ageing Aircraft Inspection:

1. It is recommended that CASA create a CAAP that deals with annual inspection matters so that the LAME performing the inspection actually understands what he/she is certifying.
 - We also recommend that the FAA Inspection Authorisation Guide be used as the basis for such a CAAP. This guide highlights the need to maintain an aircraft so that it continues to comply with the airworthiness requirements.

This emphasis is not in the current requirements and many new LAMEs do not understand the applicable airworthiness requirements that apply to the particular aircraft.

Also see Section on **LAME – Airworthy Certification** in particular the IA sub section.

Aircraft Certification Standards

The FARs state 3 basic type of inspections, an 'annual inspection' plus a 100 hourly inspection in certain operations; a 'progressive inspection' and an 'Approved Aircraft Inspection Program':

"Three basic types of inspections are available as defined below:

- (1) As required by Federal Aviation Regulation 14 CFR 91.409 (a), all civil airplanes of US registry must undergo a complete inspection (Annual) each 12 calendar months. In addition to the required Annual inspection, airplanes operated commercially (for hire or training) must also have an inspection each 100 hours of operation as required by Federal Aviation Regulation 14 CFR 91.409 (b).*
- (2) In lieu of the above requirements, an airplane may be inspected in accordance with a progressive inspection program in accordance with Federal Aviation Regulation 14 CFR 91.409 (d), which allows the workload to be divided into smaller operations that can be accomplished in a shorter period.*
- (3) If an airplane is being operated under a CFR Part 135 Certificate, the operator may elect to use an Approved Aircraft Inspection Program.*

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US manufacturers manuals are written to comply with the Federal Aviation Regulations.

However, FAR Part 43 requires the following inspection criteria:

FAR 43.15

(a) General. Each person performing an inspection required by part 91, 125, or 135 of this chapter, shall—

- (1) **Perform the inspection so as to determine whether the aircraft, or portion(s) thereof under inspection, meets all applicable airworthiness requirements;** and*

Note that the inspection criteria is based on meeting all **applicable airworthiness requirements**. This is not specified in current CAR/CASRs. This is the same provision as in the ICAO Annexes. It requires the person performing the inspection to understand airworthiness requirements. Airworthiness requirements are the 'certification' regulations.

This will be a change for the current Part 66 LAME – a lack of design airworthiness requirements knowledge. This knowledge is needed to meet airworthy inspection criteria. In particular, most general aviation aircraft on the register are certified to FAR Part 23.

A basic understanding FAR Part 23 is required. To understand "recommended maintenance instructions", the purpose of FAR 23.1529 is also required. FAR Part 23 Appendix G clarifies what has to be included in the manufacturer's maintenance manual (instructions for continuing airworthiness). Many do not understand why manufacturers have to provide "recommend inspection and maintenance periods" when the FAA does not apply the schedules to the general aviation fleet. The intent of the manufacturer's schedules are followed in the US.

FAR 91.409 excludes most general aviation aircraft from these manufacturer's recommended periods and schedules. Basically, it is not until an aircraft is used for commercial air transport operation, or are turbine powered or above a specified weight, does the manufacturer's recommended schedules become regulatory required in the FARs.

The exemption to this rule is when the FAA has approved a mandatory inspection or overhaul period, predetermined time life for a component or structural element; or a detailed inspection in the "Airworthiness Limitations" sections of the maintenance manual or they issue an Airworthiness Directive directing compliance with a recommended maintenance periods.

Only a NAA can "approve data" and this is normally restricted to design data or other NAA mandatory requirements. One explanation by the FAA is that the A&P & IA basically approve the use of acceptable data when they cross refers to the data during maintenance or the NAA or its delegate/approved person "approves" it as the only data for a specific maintenance task. Usually to address on-going time lified products.

G23.1 General. (a) *This appendix specifies requirements for the preparation of Instructions for Continued Airworthiness as required by §23.1529.*

(b) **Maintenance instructions.** (1) *Scheduling information for each part of the airplane and its engines, auxiliary power units, propellers, accessories, instruments, and equipment **that provides the recommended periods at which they should be** cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The **recommended overhaul periods and necessary cross reference to the Airworthiness Limitations section of the manual must also be included.** In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the airplane.*

Airworthiness limitations are quite different to the recommended periods contained in the maintenance instructions issued by the manufacturer of the aircraft. Even using the FAR Part 43, Appendix D annual inspection still requires the A&P mechanic with an IA to review all manufacturer instructions to ensure the annual inspection covers the areas in the manufacturer's instructions.

G23.4 **Airworthiness Limitations section.** *The Instructions for Continued Airworthiness **must contain a section titled Airworthiness Limitations** that is segregated and clearly distinguishable from the rest of the document. This section **must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure required for type certification.** If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section **must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is FAA approved and specifies maintenance required under §§ 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved."***

The "certifying" NAA 'approves' the mandatory items in the aircraft "Airworthiness Limitations" section of the Instructions for Continuing Airworthiness, or a referenced report, or the NAA may issue an Airworthiness Directive to mandate compliance with one or more of these requirements. All inclusive instructions are now common in larger transport category aircraft irrespective of operational status and other aircraft operated in passenger operations.

Of importance to the on-going maintenance and safety of general aviation aircraft is the following provisions of the Appendix G:

- b) **Maintenance instructions.** (2) *Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.*
 - (3) *Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.*
 - (4) *Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.*
- (c) *Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.*
- (d) *Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.*
- (e) *Information needed to apply protective treatments to the structure after inspection.*
- (f) *All data relative to structural fasteners such as identification, discard recommendations, and torque values.*
- (g) *A list of special tools needed.*

(h) *In addition, for commuter category airplanes, the following information must be furnished:*

- (1) Electrical loads applicable to the various systems;*
- (2) Methods of balancing control surfaces;*
- (3) Identification of primary and secondary structures; and*
- (4) Special repair methods applicable to the airplane.*

This design certification provision is about providing the applicable maintenance instructions and recommending maintenance periods or reference to a vendors manual that provides these instructions. When the LAME cross refers to this data it provides the traceability that maintenance was done to the standard provided by the manufacturer. If there are improved instructions available, for instance in a NAA promulgated instruction, the LAME may refer to that instruction to provide the safer outcome.

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Recommendation –

1. That CASA provide guidance in the AMROBA proposed CAAP dedicated to annual inspections, to explain that manufacturers only provide “recommended maintenance data” that, if followed during maintenance, will help keep the aircraft in an airworthy condition.
 - In many cases, manufacturer “recommended data” does not provide the best maintenance standards.
 - At times, NAA promulgated data provides a safer outcome.
 - This CAAP should be written so that the registered operator understands the differences between what is mandatory under the FAR system and what is acceptable.
2. Changes must also be made to the current regulatory system so that the need to certify as ‘airworthy’ will provide a better safety standard than certifying to manufacturer’s recommended maintenance instructions that usually have “get-out” clauses that places the ultimate responsibility on the LAME.
3. It is also recommended that CASA should adopt the maintenance and inspection “performance regulations” from FAR Part 43 as soon as possible. They will achieve improved safety maintenance standards.
 - The requirements of FAR Part 43 are compatible with the aircraft and information provided by FAA approved type certificate holders – CAR/CASR are not.

LAME – Airworthy Certification

Proposal 1 addressed the skilling and licencing issues with the current aircraft maintenance engineer licensing system. This proposal requires Proposal 1 to be adopted to underpin the ICAO certification privilege to certify the aircraft as airworthy.

The lack of clarity of LAME scope and ICAO privileges contrasts quite differently when a study is made of the FAA LAME equivalent, the role and privileges of the A&P mechanic holding an Inspection Authorisation.

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International similarities – the FAA IA

The FAA A&P mechanic holding an Inspection Authorisation performed the same function as the pre 1991 LAME who certified the aircraft as airworthy post an annual inspection and after a modification, repair, component replacement, etc as defined in Proposal 1.

The FAA provides the following guidance to the A&P mechanic holding an Inspection Authorisation. As can be seen by the dot points, they are the role of a LAME.

This publication provides guidance for persons who conduct annual and progressive inspections and approve major repairs and/or major alterations of aircraft holding or eligible to hold a U.S. type certificate. The Federal Aviation Administration (FAA) intends this information for mechanics who hold an Inspection Authorization (IA). This manual stresses the important role that certificated mechanics who hold an inspection authorization have in air safety.

- Approving Major Repairs and Major Alterations.
- What To Look for During an Inspection.
- Approved Data.
- Components of the Inspection.
- Annual and Progressive Inspections.
- Configuration.
- Condition.
- Minimum Equipment List.
- Airworthiness Directives.
- Malfunction or Defect Reports.
- Paperwork Review.
- Aircraft Markings.
- Aircraft with Discrepancies or Unairworthy Conditions.
- Incomplete Inspection.

The following ‘excerpts’ are from the *FAA Guide for IAs*. It requires the IA to perform airworthy inspections and certifications and these responsibilities align with the ICAO privileges for a LAME that should be part of the requirements to hold an AME licence.

Approving Major Repairs and Major Alterations

What to Look for During an Inspection

A primary responsibility of the holder of an Inspection Authorisation (IA) is to determine airworthiness by inspecting repairs or alterations for conformity to approved data, and assuring that the aircraft is in a condition for safe operation. During inspection of major repairs or major alterations, the holder of an IA must also determine that they are compatible with previous repairs and alterations that have been made to the aircraft.

The holder of an IA must personally perform the inspection. The regulations do not provide for delegation of this responsibility. Approving major repairs and major alterations is a serious responsibility. The approval action should consist of a detailed investigation to establish at least that:

1. *All replacement parts installed conform to approved design and/or have traceability to the original equipment manufacturer (OEM).*
2. *As installed, the installation conforms to approved data that is applicable to the installation.*
3. *Workmanship meets the requirements of 14 CFR part 43, § 43.13 (the aircraft or product is equal to its original or properly altered condition).*

4. The data used is appropriate to the aircraft certification rule (CAR 3, 14 CFR part 23, etc.).
5. Work is complete and compatible with other structures or systems.

The holder of an IA cannot approve the data for major repairs or major alterations. He or she may, however, inspect to see that alterations conform to data previously approved by the Administrator [or delegate] (14 CFR part 65, § 65.95). This means the holder of an IA ensures that approved data is available and is used as the basis for the approval. This availability determination should be made prior to beginning the repair or alteration. If data is unavailable, or if the holder of an IA is unsure of the acceptability of the available data, the local Aviation Safety Inspector (ASI) should be consulted.

The ASI may, as the circumstances warrant, be able to:

1. Establish an acceptable basis for approval,
2. Approve the data, or
3. Recommend application for a supplemental type certificate.

Quite often major repairs are performed that are eventually covered by fabric, metal skin, or another structure. When this situation exists, the holder of an IA should have a clear understanding with the mechanic [AME/LAME] performing the repair that a pre-cover inspection is necessary.

The inspection should assure that the repair was made in accordance with acceptable methods, techniques, and practices prescribed by 14 CFR part 43 and that the structure to be covered is free from defects, corrosion, or wood rot, and is protected from the elements. In addition, the holder of an IA should inspect other affected areas for hidden damage if the aircraft has been involved in an accident or incident. An entry is required to be made in the maintenance record and FAA Form 337, Major Repair and Alteration, must be completed. (Refer to appendix 1, figure 3, showing typical entries on the front and back of FAA Form 337.)

Minor deviation from approved data is permissible if the change is one that could be approved as a minor alteration when considered alone. Be sure to list the deviations on FAA Form 337 and make an entry in the maintenance record when completing the aircraft records.

When in doubt, contact the local ASI who may decide the change is not minor and would need specific approval or an amendment of the original approval.

Condition Inspection

The holder of an IA may use the checklist in 14 CFR part 43, appendix D, the manufacturer's inspection sheets, or a checklist designed by the holder of an IA, that includes the scope and detail of the items listed in appendix D, to check the condition of the entire aircraft. This includes checks of the various systems listed in 14 CFR part 43, § 43.15.

Routine servicing is not a part of the annual inspection. The inspection itself is essentially a visual evaluation of the condition of the aircraft and its components and certain operational checks. The manufacturer may recommend certain services to be performed at various operating intervals. These services can often—in fact, should—be done conveniently during an annual inspection, but are not considered to be a part of the inspection itself.

It is very important that the holder of an IA be familiar with the manufacturer's service manuals, bulletins, and letters for the product being inspected. Use these publications to avoid overlooking problem areas.

AC 43-16A, Aviation Maintenance Alerts, is also an important source of service experience. The articles for the alerts are taken from selected service difficulties reported to the FAA on Form 8010-4, Malfunction or Defect Reports.

1. The holder of an IA as required by 14 CFR part 43, § 43.13, determines that the required placards and documents set forth in the aircraft specification or type certificate data sheet are available and current. The aircraft should be reported as being in an unairworthy condition if these placards and documents are not available. A missing, incorrect, or improperly located placard is considered an unairworthy item, and the owner or operator should be informed that, under the requirements of 14 CFR part 91, § 91.9, the aircraft may not be operated until a correct and properly placed placard is available.

2. The holder of an IA should refer to the registration and airworthiness certificates for the owner's name and address; the aircraft make, model, registration, and serial numbers needed for recording purposes. Be sure not to use manufacturer trade names as they do not always coincide with the actual model designation (Cessna Skylane model designation is 182, Piper Seneca III is PA 34 220T, etc.). If registration and airworthiness certificates are not available, the aircraft does not need to be reported in unairworthy condition; however, the owner or operator should be informed that the documents required by 14 CFR part 91, § 91.203(a)(2), should be in the aircraft and the airworthiness certificate displayed *when the aircraft is operated*.

3. On aircraft for which no approved flight manual is required, the operating limitations prescribed during original certification, and as required by 14 CFR part 91, § 91.9, must be carried in or be affixed to the aircraft. Range markings on the instruments, placards, and listings must be worded and located as specified in the type certificate data sheet. (Refer to appendix 1, figure 7.)

Aircraft with Discrepancies or Unairworthy Conditions

If the aircraft is not approved for return to service after a required inspection, use the procedures specified in 14 CFR part 43, § 43.11. This will permit an owner to assume responsibility for having the discrepancies corrected prior to operating the aircraft. Discrepancies or unairworthy conditions can be resolved in the following ways:

1. The discrepancies can be cleared by a person who is authorized by 14 CFR part 43 to do the work. Preventive maintenance items could be cleared by a pilot who owns or operates the aircraft, provided the aircraft is not used under 14 CFR part 121, 129, or 135; except that approval may be granted to allow a pilot operating a rotorcraft in a remote area under 14 CFR part 135 to perform preventive maintenance.

2. The owner may want the aircraft flown to another location to have repairs completed, in which case the owner should be advised that the issuance of FAA Form 8130-7, Special Flight Permit, is required. This form is commonly called a ferry permit and is detailed in 14 CFR part 21, § 21.197. The certificate may be obtained in person or by fax at the local FSDO or from a Designated Airworthiness Representative.

3. If the aircraft is found to be in an unairworthy condition, an entry will be made in the maintenance records that the inspection was completed and a list of unairworthy items was provided to the owner. When all unairworthy items are corrected by a person authorized to perform maintenance and that person makes an entry in the maintenance record

FAA Performance Rules

The 1988 regulatory changes accepted that the FAA is responsible for the type design and the FAA approved manufacturers holding type certificate holders for on-going continuing airworthiness responsibilities of their type certificated products.

In doing so, it was accepted that the mandatory minimum inspections and maintenance standards would be adopted for these FAA certified general aviation aircraft – standards that are mainly specified in FAR Parts 91 and 43.

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- This has not eventuated and is another reason for current concerns raised by CASA.

FAR Part 91 states ‘what’ and ‘when’ inspections and maintenance actions must be performed and Part 43 states ‘who’ may perform those **inspections**. Part 43 includes ‘performance standards’ that must be applied to both maintenance and inspections but are missing from the Australian system. The FAR ‘performance standards’ are important and should be adopted word for word by Australia to improve safety.

Under the FAA system, the dedicated “annual inspection”, note their “annual” is only an inspection not a maintenance schedule as currently depicted in CARs, may only be carried out by an airframe and powerplant mechanic holding an Inspection Authorisation (IA) – it is not the annual “maintenance schedule” as depicted in Australia.

Holders of an IA have been individually assessed by the FAA as having the experience to personally perform “annual inspections” and certify as airworthy post other work – it is not an ‘inspection’ that can be delegated or supervised, it must be done by the IA. There is great importance placed on having the experience by the FAA just like what was applied to obtain a CAR 31 aircraft maintenance engineer licence.

The A&P mechanic may perform a 100 hourly inspection (routine inspection), if they had been supervised by an experienced A&P mechanic previously, based on the same items to be inspected by the IA at the annual inspection that are referred to in Schedule D of CFR part 43.

FAR 43.15 (1) Perform the inspection so as to determine whether the aircraft, or portion(s) thereof under inspection, meets all applicable airworthiness requirements; and [editorial note: this is why the IA is tested for experience and knowledge of *airworthiness requirements*]

(2) If the inspection is one provided for in part 125, 135, or § 91.409(e) of this chapter, perform the inspection in accordance with the instructions and procedures set forth in the inspection program for the aircraft being inspected.

“Airworthiness requirements” are contained mainly in Part 23 for these aircraft.

However, the “Annual Inspection” is a FAR 91 requirement and is not an outcome of the FAR part 23 certification of the aircraft; nor is it dependent on the manufacturer’s “recommended inspection periods” contained in the “manufacturer’s maintenance schedule” section of the manufacturer’s maintenance manual. (see *Aircraft Certification Standards*).

Background

For the United States system to be adopted in Australia, current philosophies relating to continuing airworthiness of the general aviation fleet will need to change. For instance, every general aviation aircraft manufacturer’s maintenance manual has a similar get-out clause in their maintenance manual that state:

“The inspection guidelines contained in this section are not intended to be all-inclusive, for no such charts can replace the good judgement of certified airframe and powerplant mechanics in performance of their duties. As the one primarily responsible for the airworthiness of the airplane, the owner or operator should select only qualified personnel to maintain the airplane.”

This places the responsibility on the LAME to use their experience and knowledge and also on the registered operator to select the right AMO or LAME to maintain their aircraft.

These statements are not only written in manuals by manufacturers to meet possible liability issues but to ensure the regulatory responsibility of the airframe and powerplant mechanic, including the mechanic holding a FAA issued Inspection Authorisation, can meet their regulatory responsibilities. The aircraft manufacturer does not, and cannot override the regulatory responsibilities of the FAA certified mechanic and the aircraft registered operator.

For the majority of Australian registered general aviation aircraft, irrespective of hours, the 12 months periodic (annual) inspection in the current legislation should adopt philosophies associated with implementing the FAA “annual inspection”.

FAR 43 – Performance rules (general).

(a) Each person performing maintenance, alteration, or preventive maintenance on an aircraft, engine, propeller, or appliance shall use the methods, techniques, and practices prescribed in the current manufacturer’s maintenance manual or Instructions for Continued Airworthiness prepared by its manufacturer, or other methods, techniques, and practices acceptable to the Administrator, except as noted in § 43.16. He shall use the tools, equipment, and test apparatus necessary to assure completion of the work in accordance with accepted industry practices. If special equipment or test apparatus is recommended by the manufacturer involved, he must use that equipment or apparatus or its equivalent acceptable to the Administrator.

(b) Each person maintaining or altering, or performing preventive maintenance, shall do that work in such a manner and use materials of such a quality, that the condition of the aircraft, airframe, aircraft engine, propeller, or appliance worked on will be at least equal to its original or properly altered condition (with regard to aerodynamic function, structural strength, resistance to vibration and deterioration, and other qualities affecting airworthiness).

(c) *Special provisions for holders of air carrier operating certificates and operating certificates issued under the provisions of Part 121 or 135 and Part 129 operators holding operations specifications.* Unless otherwise notified by the administrator, the methods, techniques, and practices contained in the maintenance manual or the maintenance part of the manual of the holder of an air carrier operating certificate or an operating certificate under Part 121 or 135 and Part 129 operators holding operations specifications (that is required by its operating specifications to provide a continuous airworthiness maintenance and inspection program) constitute acceptable means of compliance with this section.

FAR 43 – Performance rules (inspections).

FAR 43.15

(a) *General. Each person performing an inspection required by part 91, 125, or 135 of this chapter, shall—*

(1) Perform the inspection so as to determine whether the aircraft, or portion(s) thereof under inspection, meets all applicable airworthiness requirements; and

(2) If the inspection is one provided for in part 125, 135, or §91.409(e) of this chapter, perform the inspection in accordance with the instructions and procedures set forth in the inspection program for the aircraft being inspected.

(b) *Rotorcraft. Each person performing an inspection required by Part 91 on a rotorcraft shall inspect the following systems in accordance with the maintenance manual or Instructions for Continued Airworthiness of the manufacturer concerned:*

(1) The drive shafts or similar systems.

(2) The main rotor transmission gear box for obvious defects.

(3) The main rotor and center section (or the equivalent area).

(4) The auxiliary rotor on helicopters.

(c) *Annual and 100-hour inspections.*

(1) Each person performing an annual or 100-hour inspection shall use a checklist while performing the inspection. The checklist may be of the person's own design, one provided by the manufacturer of the equipment being inspected or one obtained from another source. This checklist must include the scope and detail of the items contained in appendix D to this part and paragraph (b) of this section.

(d) *Progressive inspection.*

(1) *Each person performing a progressive inspection shall, at the start of a progressive inspection system, inspect the aircraft completely. After this initial inspection, **routine and detailed inspections** must be conducted as prescribed in the progressive inspection schedule. **Routine inspections consist of visual examination or check** of the appliances, the aircraft, and its components and systems, insofar as practicable without disassembly. **Detailed inspections consist of a thorough examination** of the appliances, the aircraft, and its components and systems, **with such disassembly as is necessary**. For the purposes of this subparagraph, the overhaul of a component or system is considered to be a detailed inspection.*

Adopting the FAR Annual

By making the registered operator responsible for not flying the aircraft unless it is airworthy, the FAR system places the responsibility on that person to have maintenance, other than the regulatory mandatory “annual inspection”, carried out.

These aircraft are maintained to On-Condition requirements that an aircraft, appliance or part be periodically inspected or checked against some appropriate physical standard to determine whether it can continue in service. The purpose of the standard is to remove the unit from service before failure during normal operation occurs. Example of an OC process is measurement of brake wear indicator pins; compare brake wear condition against a specified standard or limit. Brake wear will vary considerably among operators due to operational conditions, however the wear indicator pin on-condition check will help attain near maximum usage out of each set of brakes. What must be remembered is that manufacturers are required by regulation to provide recommended maintenance instructions, but only those “instructions” approved by the NAA or included in regulations are mandatory.

CASA needs to introduce a FAA style mandatory annual inspection separate from the CASA or Manufacturer maintenance schedule election process currently in the CARs.

Summary

By deleting the 3 year major inspection and not replacing it with the FAA annual inspection, CASA has created the causal issues relating to ageing aircraft. There would be no need to mandate manufacturer’s recommended maintenance instructions nor to raise airworthiness directives of items because of reports by industry. The annual inspection would inspect in detail based on the LAME experience and reference to all maintenance documentation.

The annual inspection should be the only mandatory inspection of general aviation aircraft not on a system of maintenance that includes the intent of an annual inspection and must be separate to the CASA maintenance schedule or manufacturer’s maintenance schedule.

When a (FAA) annual inspection is carried out, it is when the CASA maintenance schedule or manufacturer’s maintenance should also be performed. However, that should remain the preference of the registered operator.

Recommendations

1. It is highly recommended that CASA utilise CASR Part 43, currently reserved, to identify the non-airline airworthiness and maintenance requirements based on FAR Part 43. Adoption of FAR Part 43, in the same manner as CASR Part 21 was adopted, would supplement CASR Part 21 that was also based on FAR Part 21.
2. Adoption of FAR Part 43 would simplify maintenance as US manufacturer maintenance manuals cross refer to the FARs regularly. By adopting the FAR requirements, instructions in supporting documentation promulgated by the FAA associated with keeping their type certificated in an airworthy condition would also apply in Australia.

Explanation

FAR Part 43 includes performance requirements for maintenance and inspection as well as being harmonised with the CASR part 21 that is applicable to all aircraft. Adopting the FAA system would apply the same maintenance standards as was expected when CASR Part 21 was made.

When maintaining a FAA type certificated aircraft, references to the FAR standards would then provide clarity in the airworthiness and maintenance standards applied by the FAA to ensure aircraft remain airworthy and maintained in a serviceable condition.

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This approach has been supported by the general aviation industry for over two decades but totally ignored during the last decade.

Proposal Recommendations

There are short term recommendations and long term recommendations contained in this proposal. The short term actions need to happen as soon as possible to improve general aviation airworthiness and maintenance regulatory standards for ageing aircraft.

To provide as close as possible maintenance standards as those that are applied by the FAA, it is recommended the adoption of the FAR system of aircraft “inspection” requirements under FAR Part 91.409, including FAR Part 43 performance regulations.

Included in the overall recommendation is the adoption of the FAA “annual inspection” that is discussed in this proposal.

Short Term Recommendation

1. That CAAP 42B-1 be removed, amended in collaboration with industry association representatives, to include clear internationally accepted airworthiness and maintenance standards of inspection to be applied during the CASA Maintenance Schedule.
 - This can be achieved by adopting US manufacturer definitions of ‘routine’ and ‘detailed’ inspections contained in their maintenance manuals and then apply them to the CASA Maintenance Schedule.
 - Routine inspections do not require disassembly whereas detailed inspections require disassembly as necessary to complete the inspection.
 2. To achieve short term benefits it is strongly recommended that paragraph 2.7 in the CASA Maintenance Schedule be replaced with similar words from the FAA system, as follows:

2.7 Unless otherwise indicated in the table, where the table is used for either a 100 hourly inspection or a periodic (annual) inspection the following criteria applies.

 - **100 hourly Inspection – Is a routine inspection consisting of visual examination or check of the appliances, the aircraft, and its components and systems, insofar as practicable without disassembly.**
 - **Annual Inspection – Is a detailed inspection consisting of a thorough examination of the appliances, the aircraft, and its components and systems, with such disassembly as is necessary to certify the aircraft or system as airworthy.**
 3. It is also recommended that CASA create a CAAP that deals with “annual inspection” matters in a similar manner as the FAA specifies for the IA so that the LAME performing the inspection actually understands what he/she is certifying.
 - We recommend that the FAA Inspection Authorisation Guide be used as the basis for such a CAAP. This guide highlights the need to maintain an aircraft so that it continues to comply with the applicable airworthiness requirements.
 - This emphasis is not in the current requirements and many new LAMEs do not understand the applicable airworthiness requirements that apply to the particular aircraft.
-

Long Term Recommendations

4. It is highly recommended that CASA utilise CASR Part 43, currently reserved, to identify the non-airline airworthiness and maintenance requirements based on FAR Part 43. Adoption of FAR Part 43, in the same manner as CASR Part 21 was adopted, would supplement CASR Part 21 requirements in the same manner as it is done in the FAA system.
5. Adoption of FAR Part 43 would simplify aircraft maintenance as US manufacturer maintenance manuals often cross refer to the FARs regularly. By adopting the FAR requirements, instructions in supporting documentation promulgated by the FAA associated with keeping their type certificated in an airworthy condition would also apply in Australia.
6. Adoption of FAR 91.409 requirements in a future CASR Part 43 would remove the continual ambiguities of the CAR/CASR system when meeting international standards and obligations. This should be achieved within 2 years.

Outcome Proposal 2:

General aviation has been opting for the FAR system to be adopted for the last couple of decades but what they are enduring is an ever increasing regulatory system with excessive red tape with lower standards than pre regulatory changes. The outcome of this proposal will apply similar standards and practices as are used in the United States for airworthiness and maintenance of the mainly FAA type certificated general aviation aircraft fleet.

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Adoption of this proposal will reduce for CASA to run ageing aircraft programs that damage the resale value of the Australian general aircraft fleet and the need for unique ADs for replacement of flight control cables. Using similar inspection criteria to the FAA should prevent the need for CASA to raise such unique maintenance requirements.

This proposal will return to the Australian general aviation airworthiness and maintenance system, inspections to ensure aircraft continue to meet the applicable airworthiness requirements, i.e. the aircraft is airworthy. This is the basis of the ICAO standard and is included in the FAA system and was the basis of the CARs pre 1991.

This proposal is also dependent on the implementation of AMROBA Proposal 1 for the LAME.

The short term recommendations enables the annual inspection, performed by the same LAME/AMO, to disassemble the aircraft as necessary to certify the aircraft and systems as airworthy. Inspections must be treated differently to carrying out other maintenance tasks.

Adopting the FAR maintenance and inspection performance standards will mean aircraft on-going airworthiness and serviceability will be the same as that applied by the FARs.

Harmonising the airworthiness and maintenance requirements with those of the FARs acknowledges that the vast majority of the general aviation fleet have FAA type certificates.

By using FAR inspection and maintenance standards, including the contents of what and how the maintenance records are kept, will mean international recognition of these records.

By providing similar requirements to those contained in the applicable provisions of the FARs, registered operators will have aircraft maintenance records that are acceptable in North America thus improving the resale value of general aviation aircraft.

This proposal also provides the same clarity in inspection and maintenance requirements that is available to general aviation in the United States.

The short term recommendations enables the annual inspection, performed by the same LAME/AMO, to be disassembled as necessary to certify the aircraft and systems as airworthy once again. Inspections must be treated differently to carrying out other maintenance tasks.

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