AVIATION MAINTENANCE REPAIR & OVERHAUL BUSINESS ASSOCIATION, INC

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ADVOCATE OF THE AVIATION MRO INDUSTRY

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Aviation—V—Regulation

One of the problems that has confronted the aviation industry over the last couple of decades is the increasing red tape and legislation, not just aviation legislation. The Productivity Commission has been warning successive Federal Governments of the effects on industry of over regulation. The whole regulatory reform process is not being developed to enable aviation to prosper and serve the many communities of Australia.

The outcome of most legislation that has been made since reform started in the mid 80s has seen a continual growth in the size of government departments instrumentalities to meet increasing micro – management of private enterprises.

Before any regulation is contemplated, aviation risk taking entrepreneurs should be asked what aviation services do they intend/propose to provide.

Before considering legislation, the viability and level of safety should be identified. Unlike Europe and North America, remote regional Australia does not have the populous to support jet transport nor is there the infrastructure to support such operations.

This should not prevent a remote location being serviced by a C172 or even a PA32. If red tape stops such air services from being provided, then the need for such legislative or administrative requirements to be changed is obvious.

Ever since regulatory change started in the early 1990s to harmonise globally, approximately 50% of regional Australia that had an air service no longer has such a service. Why? increased red tape.

We realise that improvements in roads has put additional pressure on providing these air services competitively but most see regulatory requirements far exceed what is needed to keep air services safe.

Australia has a mature aviation industry that should enable governments to make legislation that recognises this fact. If outcome based regulations were properly made, then individuals and businesses would be held fully accountable for managing their businesses and individual's responsibilities.

Interestingly, ICAO Annexes do not require AOCs for anything else but air transport.

ICAO: Commercial air transport operation. An aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.

Aerial work. An aircraft operation in which an aircraft is used for specialized services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement, etc.

General aviation operation. An aircraft operation other than a commercial air transport operation or an aerial work operation.

"ICAO: *An element of the safety of an operation is the intrinsic safety of the aircraft, that is, its level of airworthiness. The level of airworthiness of an aircraft is, however, not fully defined by the application of the airworthiness Standards of Annex 8, but also requires the application of those Standards in the present Annex 6 that are complementary to them*."

The Standards and Recommended Practices contained in Annex 6, Part I, shall be applicable to the operation of aeroplanes by operators authorized to conduct international commercial air transport operations.

ICAO: *The human being is the vital link in the chain of aircraft operations but is also by nature the most flexible and variable. Proper training is necessary so as to minimize human error and provide able, skilful, proficient and competent personnel.*

We know international air transport use aircraft above a certain size - [*i.e. mainly above 30 seats maybe*] - so the use of smaller aircraft for domestic air routes should, where appropriate, have an adjusted standard that is applicable to the design standard of the aircraft proposed to be used on airstrips that don't or may not comply to ICAO international standards.

Since CASA's predecessors moved Head Office from Melbourne, aviation lost the support of a government department committed to providing air transport services to regional Australia.

Sadly, we now have a risk averse approach to the provision of air transport services to other than what can be provided by large air transport category aircraft.

Future Skill Needs

A project that UNSW is carrying out has identified that educating our aircraft maintenance professionals is not aligned with world best practice.

A review of the training of maintenance personnel in North America (USA/Canada) and Europe has clearly identified that full-time academic skilling has replaced the old method of apprenticeships.

This method means that a school leaver can continue their academic training by undertaking a full-time course with an outcome that provides the industry with a flexible and mobile workforce.

AQF Qualification in Level Structure

Level	Summary	Qual Type
I	Graduates at this level will have knowledge and skills for initial work, community involvement and/or further learning	Certificate I
II	Graduates at this level will have knowledge and skills for work in a defined context and/or further learning	Certificate II
III	Graduates at this level will have **theoretical and practical knowledge and skills for work** and/or further learning	Certificate III
IV	Graduates at this level will have **theoretical and practical knowledge and skills for specialised and/or skilled work** and/or further learning	Certificate IV
V	Graduates at this level will have **specialised knowledge and skills for skilled**/paraprofessional **work** and/or further learning	Diploma

Every aircraft maintenance task needs some theoretical knowledge so that maintenance errors are not introduced — this means the minimum qualification for anyone with release to service certification responsibility should be at least Cert III. Cert IV is an appropriate level for persons to perform and certify maintenance. Diploma is the level to sign completion of stages of maintenance, conformity inspection of modifications and repairs and the certification to release aircraft to service.

Level 5, Diploma, is the LAME level.

Though many realise that ICAO provides, in Annex 1, the standards, privileges and how the AME licence should be issued, including ratings, the rest of the world has moved closer together with full-time training that produces an avionic and mechanical LAME.

This approach aligns with world's best practice.

What it guarantees is a skilled person with transportable skills that supports an aviation industry not just a specific sector. This is a flaw with Australia's apprentice system where State laws requires the trade to be trained specific to business needs—they are not industry training standards.

The Federal Government has recognised this a decade ago but States continue with the narrower training instead of skilling for the whole industry.

There is a paper on Maintenance Up-skilling on our website under Association News.

Link: Maintenance Up-skilling

Annex 8. 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.**

The LAME, globally, plays an important role in performing 'conformity' inspections to ensure that aircraft's certificate of airworthiness remains valid. This includes the "annual inspection" for aircraft that do not have a system of maintenance.

Conformity to meet the type certification standard and to ensure that modification and repairs conform with the design data.

This aspect is not well explained in regulations at this moment but it was once well understood when there was a 3 year major requirement to meet the periodical inspection. See Article of page 4.

The UNSW Future Maintenance and Maintenance Skill Needs project that we participate in is discovering that our training processes are out of step with the rest of the world regarding the skills required and the training methods.

Full time training (theory and practical) in the same manner as NZ, FAA, EASA, TC, Asia, etc has enabled those countries to stay harmonised with each others skill standards.

The future is to go with the system that the rest of the world is or has implemented so our global credibility can be retained.

There is no reason why an Australian full-time course should not be compatible to the skills produced in North America and Europe, and in particular align with NZ and this Asian/Pacific region. Get the academic skills right and the CASA licensing follows.

Continuing Airworthiness Improvement

Excerpts from a FAA article on improving continuing airworthiness.

Small airplanes and rotorcraft operate in a much broader spectrum of functional modes than most large airplanes. For example, small airplanes and rotorcraft operate as air taxis, corporate aircraft, business aircraft, personal aircraft, and instructional aircraft. Other roles include sightseeing, pipeline patrol, law enforcement, emergency rescue, scientific experimentation, transport of external loads, crop dusting, and fire-fighting. Operational cycles are also very different. A typical small airplane or rotorcraft is in the air many fewer hours per year than a typical large transport—an average of 140 (<30 in Australia) hours for small airplanes and rotorcraft, compared to 3,000 to 3,500 hours for large transport airplanes operated by major air carriers. Small airplanes and rotorcraft also operate out of many more airports and landing areas than large airplanes, and many of these lack control towers and other landing and takeoff aids. Small aircraft, rotorcraft, and large transport airplanes do share much of the same airspace and use many of the same facilities, however. Thus, despite their differences, it is essential that systems and procedures allow them to operate together safely (GAMA, 1997; FAA, 1996a, 1996b)

The safety management process for the small airplane and rotorcraft communities must be flexible enough to accommodate the diverse nature of these communities, and this is likely to be a difficult challenge. Safety management processes for small airplanes and rotorcraft must overcome challenges associated with a much greater assortment of aircraft designs, more varied operational roles, and a much larger number of operators than those of large airplanes. In most cases, these differences are inherent and unavoidable. For example, large transport airplanes carry sophisticated flight management systems and safety devices, which have helped them achieve a much lower accident rate than small airplanes and rotorcraft. However, the cost of these systems exceeds the total value of many small airplanes, and the systems would be impractical to install on small airplanes or rotorcraft because of configuration limitations (weight, volume, electrical power, etc.).

Very few operators of small airplanes and rotorcraft **have the resources to establish flight operations, aircraft maintenance, or data analysis comparable to those of major airlines**. Many rely almost exclusively on other organizations, such as the FAA, manufacturers, repair stations, individual licensed mechanics, and/or professional organizations, to provide these resources. In particular, many small operators rely on the FAA to tell them (in the form of an AD) when special action is needed to correct unexpected safety deficiencies in their aircraft. Yet it is often difficult for the FAA to obtain comprehensive safety-related feedback upon which to base ADs because the applicable regulations (FAR Parts 61, 63, 65, 91, 133, and 137) do not require most operators of small airplanes and rotorcraft to report safety hazards.

Although human factors are clearly the leading cause of small airplane accidents, NTSB accident reports often provide only sketchy details about the human factors leading to an accident.

Feedback can be better in Australia.

OMF Symphony—EASA Type Certificated

Industry slowdown

The growth in experimental airplanes was partly the result of a huge slowdown in the commercial small-aircraft market. By the early 1980s, production of general-aviation airplanes all but ground to a halt as liability concerns grew and new plane development became prohibitively expensive. By 1988, less than 1,000 new single-engine planes were delivered to customers, some 90 percent less than in 1980. Many models stopped production and few new companies wanted to enter the market. The millions of dollars required to win FAA certification made it impossible for most companies to ever envision turning a profit with small planes.

Many technological advances from the experimental world found their way into the larger aircraft market. Two of the most highly respected makers of single-engine aircraft, Cirrus Design and Lancair, both got their start in the mid-1980s developing kits. Small aircraft design innovation is coming from the experimental, especially those manufacturers that build advanced kits ready for assembly.

A modified version of the GlaStar, the "OMF Symphony", was certified by German aviation authorities and is now sold as a factory-built plane.

The (Misunderstood) Annual Inspection

Though the scope of a 100 hourly and annual inspection is the same, the purpose of the inspection is quite different.

Not understanding the difference is why CASA is getting a little concerned with 'ageing' aircraft.

All CASA has to do to address this concern is raise an advisory document that provides the necessary guidelines for an 'annual inspection'.

For instance, by far the majority of aircraft on our register that do not operate to a system of maintenance, are FAA type certificated.

Therefore we should ask ourselves why a FAA TC'd aircraft should be maintained to a lower standard than what the FAA has determined.

When a FAA TC'd aircraft maintenance manual prescribes the schedule to be used for the 100 hourly and annual it does not explain that in the FAA system there are different skilled persons that do these inspections.

Therefore, understanding the difference between "routine" and "detailed" inspections as specified for FAA TC aircraft is the key to doing the inspection properly in Australia.

Basically, a 100hourly inspection is a routine service inspection whereas the annual inspections is a detailed inspection.

FAA meanings:

Routine Inspection—*visual examination or check of appliances, aircraft, and components and systems insofar as practicable* ***without disassembly***.

Detailed Inspection—*thorough examinations of the appliances, the aircraft, the components and systems* ***with such disassembly*** *as is necessary to determine condition.*

Note: *this could mean de-riveting structures to gain access if defects are suspected.*

The A&P mechanic can do the 100 hourly inspection (***basically a routine inspection***) but not the annual (***routine and detailed inspection***). Only those A&P mechanics that have an Inspection Authorisation can do the annual inspection.

Why? Simply because the FAA IA is doing a conformity inspection and maintenance records check to validate the continued compliance of the certificate of airworthiness and compliance with regulatory requirements.

It is how the FAA complies with ICAO Annex 8 to have an inspection system to enable an indefinite certificate of airworthiness to exist.

All annuals, like the 100hourly, require a pre-inspection engine run where all **instruments/radios** must be checked—they are also checked post inspection.

"*The aircraft should conform to the aircraft specification or type certificate data sheet, any changes by supplemental type certificates, and/or its properly altered condition. When the aircraft does not conform, use the procedures for "unairworthy" items listed in 14 CFR part 43, § 43.11(a)(5)."*

The above statement includes all additional equipment fitted to the aircraft—confirmation that those products conform.

Read FAR **§ 65.95 Inspection authorization: Privileges and limitations.**

(1) ***Inspect*** and approve for return to service any aircraft or related part or appliance … after a major repair or major alteration …

(2) ***Perform an annual, or perform or supervise a progressive inspection***

AMROBA advises all LAMEs performing annual inspections to download a copy from the FAA website the Guide: Inspection Authorization Information Guide, Doc **FAA-G-8082-19 IA Guide is available on the FAA website.**

The FARs also have regulatory requirements that ensure that transponders and altimetry have additional checks at specific intervals.

Review aircraft and component manufacturers' schedules.

Additional advice is provided by the FAA & US GA industry on addressing ageing aircraft. Their Ageing Aircraft Best Practices is available on our website.

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The Aircraft Maintenance Engineers/Technician Creed

Worth Remembering

"UPON MY *HONOR* *I swear that I shall hold in sacred trust the rights and privileges conferred upon me as a qualified aircraft maintenance engineer/technician. Knowing full well that the safety and lives of others are dependent upon my skill and judgment, I shall never knowingly subject others to risks which I would not be willing to assume for myself, or for those dear to me.*

IN DISCHARGING *this trust, I pledge myself never to undertake work or approve work which I feel to be beyond the limits of my knowledge nor shall I allow any non qualified superior to persuade me to approve aircraft or equipment as airworthy against my better judgment, nor shall I permit my judgment to be influenced by money or other personal gain, nor shall I pass as airworthy aircraft or equipment about which I am in doubt either as a result of direct inspection or uncertainty regarding the ability of others who have worked on it to accomplish their work satisfactorily.*

I REALIZE *the grave responsibility which is mine as a qualified aircraft maintenance engineer/technician, to exercise my judgment on the airworthiness of aircraft and equipment. I, therefore, pledge unyielding adherence to these precepts for the advancement of aviation and for the dignity of my vocation."*