AMROBA®inc
AVIATION MAINTENANCE REPAIR & OVERHAUL BUSINESS ASSOCIATION, INC
ADVOCATE OF THE AVIATION MRO INDUSTRY

Date Published 27/03/2019	NEWSLETTER	Volume 16 – Issue 2 March — 2019

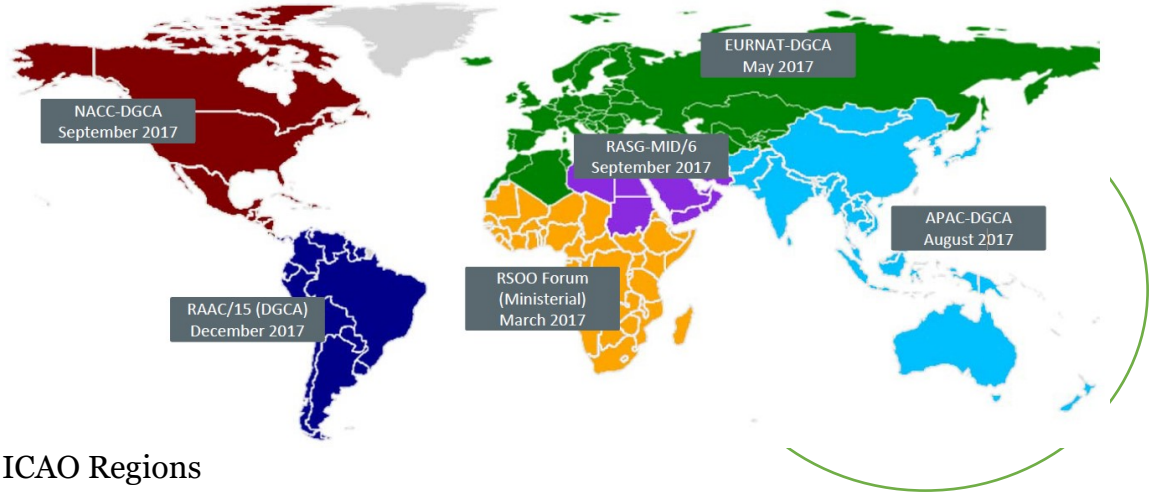
30 Years – Reform Fatigue

When the Federal Labour Government in the late 1980s decided to 'economically' reform the aviation industry it never expected that some 30 years later it would not be completed. It is ironical that reforms to remove duplication and acceptance of other mature aviation regulators certificates/licences, removal of duplication with other federal government departments/agencies requirements, has not been achieved.

Contents

Ken. R. Cannane
Executive Director
amroba@amroba.org.au

Regional Endorsement



ICAO Regions

Design/Manufacturing Need Nurturing

The aviation operational/maintenance market that we work in needs harmonised mature design and manufacturing system support. Australia's design and manufacturing has proven over decades that it has the innovative skills to participate in the global aviation market with individual design and manufacturing companies obtaining recognition from foreign countries and aviation regulators.

Without doubt, CASA approved design organisations and aircraft/parts manufacturing organisations should not be restricted the Australian aviation market. In this modernised aviation industry, it is time the maturity of this segment be regulatory recognised and properly empowered.

It is time the aviation functions of government be reduced and the industry empowered to take responsibility for what they do. Example: the FAA system:

> "The Organization Designation Authorization (ODA) program is the means by which the FAA grants designee authority to organizations or companies. The regulations addressing the ODA program are found in Title 14 of the Code of Federal Regulations (14 CFR) part 183, subpart D, sections 183.41 through 813.67.
>
> ODA holders are typically authorized to conduct the types of FAA functions which they would normally seek from the FAA. For example, aircraft manufacturers may be authorized to approve design changes in their products and repair stations may be authorized to approve repair and alteration data."

Australia needs Part 21 Subpart J design organisations that can:

- Continue to provide industry with approved repairs and modifications.
- Approve airworthiness processes and procedures.
  - May be alternative to manufacturer's data.
- Approve STCs that do not change the aircraft TCDS.
- Approve non critical Parts Manufacturing Approvals.
- Approve non critical Technical Standard Orders.
- Provide Air Operator technical services.
- Provide Type Certificate certification findings.

> **"TC ODA** — Holders of a TC ODA may manage and make findings for type certification programs. In addition to the engineering and manufacturing approvals that are part of the certification program, a TC ODA holder may issue airworthiness certificates, but may not issue an original type certificate (TC) or amended TC. A TC ODA is available to organizations holding a TC issued by the FAA."

The "fortress Australia" approach to regulatory and red tape development must be replaced with an "Indo/Asia/Pacific" approach if our industry is to grow and participate in globally.

It is straight economic practical sense to move in the same direction as the FAA, EASA and TCA, especially as has been adopted in this region.

The coming elections has moved urgently required reforms into the future, once again.

- When will our regulatory system mature?
- When will we re-align CASR Part 21 with FAR Part 21?

EXCEPT:

Part 21, Subpart J based on CS Part 21 J

- Need to include FAR Part 183, FAA devolvement to ODAs

Part 21 M needs to adopt FAR Part 183 independent designees.

We also need the Civil Aviation Act amended so CASA has a function under Section 9 to actively attain international agreements for the benefits of Australian engineering segments. e.g. design, manufacturing, maintenance services and technical training.

Back to the Top

Aircraft Safety Relies on Maintenance Skills

No matter how smart modern aircraft become in self-analysing defects and providing the trouble-shooting process, the skills of the aircraft maintenance engineer is crucial in determining the aircraft is airworthy pre returning to service. However, the skills needed to return to service a general aviation light aircraft is very different to the skills needed for modern passenger airline operated aircraft. The practical skills are different and the theoretical knowledge is very different.

***Note**: It is always sensible to have a reminder occasionally, our safety culture relies on the attitudes of AMEs/LAMEs.*

ATSB Report 2016

Aircraft system problems

> "Around 43 per cent of aircraft system issues were avionics or flight instrument problems. The majority of these incidents were minor in nature, and affected a wide range of aircraft systems and aircraft types.
> About 15 per cent of all aircraft system issues involved issues with flight controls, 14 per cent were air and pressurisation system issues and another 14 per cent were hydraulic issues. Very few incidents, around three per cent

of all systems issues, were related to anti-ice protection or fuel system problems.

Power plant and propulsion

In 2016, there were 19 accidents, one resulting in serious injury, and 25 serious incidents involving to engine-related issues reported to the ATSB involving general aviation aircraft. Half of these occurrences involved aircraft conducting private/business operations. This was consistent with the 10-year average.

The majority of these engine-related accidents and serious incidents were due to an engine failure or malfunction; nine were investigated by the ATSB. Around 40 per cent of the engine failures occurred shortly after take-off and during climb."

A US NTSB Safety Alert, revised December 2015, highlighted some accidents and provided some sound advice for maintenance personnel.

"*The following accident summaries illustrate some common — and preventable — maintenance-related accident scenarios:*

- *A commercial pilot was killed when his Beech 36 airplane struck a tree and the ground during an emergency landing in night instrument meteorological conditions following a loss of engine power in flight. The investigation found that the engine had been reassembled incorrectly during a recent overhaul. Maintenance personnel had applied silk thread and gasket-making material to the sealing surfaces of the main bearing bosses, which is inconsistent with the engine manufacturer's maintenance instructions. The improper sealing of the crankcase prevented adequate clamping at the main bearing bosses, which resulted in the fragmentation of a main bearing and the failure of the crankshaft.*
- *A private pilot and an instructor were injured (one seriously) during a forced landing of a Piper PA-46-310P airplane following a loss of engine power during cruise flight. The induction elbow for the Nos. 1, 3, and 5 cylinders was displaced from the throttle and metering assembly where the elbow couples with the assembly by an induction hose and clamp. The investigation found that the securing clamp was not properly positioned per the manufacturer's instructions, which allowed the induction tube elbow to separate from the assembly in flight. The induction system had been recently removed during maintenance*.

What can maintenance technicians [AME/LAME] do?

- *Remember that well-meaning, motivated, experienced ~~technicians~~ LAMEs can make mistakes. Learning about and adhering to sound risk management practices can help prevent common errors that can lead to tragic consequences.*
- *Understand the safety hazards associated with human fatigue and strive to eliminate fatigue contributors in your life. Fatigue has been linked to forgetfulness, poor decision making, reduced vigilance, and other factors that can interfere with your ability to do your job safely.*
- *Pay particular attention to the safety and security of the items that undergo maintenance and any surrounding components that may have been disconnected or loosened (possibly to ease access) during that maintenance.*

- *Carefully follow manufacturers' instructions to ensure that the work is completed as specified. Always refer to up-to-date instructions and manuals when performing a task, and ask questions of another qualified person if something is unfamiliar to you.*
- *Have a qualified person, other than the person who performed the maintenance, inspect the safety and security of critical items that have received maintenance.*
- *Be thorough when performing routine inspections. Ensure that items needing immediate attention are addressed rather than deferred."*

Back to the Top

Basic Trade Skills

The training and skills of the maintenance workforce has lost all significance with the skill needed for the aviation maintenance industry. With both aging legacy aircraft and modern aircraft part of the aircraft fleet, a new approach to provide skills appropriate to these aircraft should be introduced. The basic practical standards that once underpinned our trade training system has been replaced by sub-standard competency-based standards training that is more theoretical than practical skills.

The problem is providing the basic practical (trade) and knowledge skills to support the Australian aircraft fleet.

The current NVET system does not provide basic minimum practical skills. Large organisations usually provide additional practical training to address the shortfall of the NVET system. Australian aviation training standards are based on the regulatory adopted knowledge standards applied in Europe. In Europe, the standards state that theoretical/practical ratio has been specified in European Aviation Safety Regulation Part 147 licence courses.

Basic Course	Duration (in hours)	Theoretical Training Ratio (in %)
B1.1	2400	50–60
B1.2	2000	50–60
B1.3	2400	50–60
B1.4	2400	50–60
B2	2400	50–60

The basic 50/60% theoretical ratio clearly identifies that between ***960 to 1200 class room hours*** should be allocated to associated practical skills.

Aircraft reliability has removed the amount of practical training available to be obtained by on-the job practical skills/experience. Today, there is a growing need to obtain class room practical skills to overcome the reliability of aircraft.

Practical training of ***960 – 1200*** hours can be covered by dedicated practical training programs that are adopted by larger maintenance companies but not by micro/small maintenance organisations.

In Europe, basic practical trade training is mainly provided by each EU country independent to the EASA regulated aviation training standards.

ICAO Annex 1, Chapter 4 identified guidance (Training Manual) specifying what consists practical training standards, with specified training hours, that once underpinned Australia's aircraft maintenance trade training.

ICAO Knowledge training	ICAO Practical Skill Training
• Avionics knowledge training hrs: 2710 hrs • Mechanical knowledge training hrs: 2125 hrs	• Avionic skill training hours: 3075 hrs • Mechanical skill training hours 2825 hours
• Avionic total training hours: 5785 hrs	• Mechanical total training hours: 4950 hrs

The above chart is based on an **avionic** & **mechanical** training pathway.

The Australian mechanical stream has an aeroplane and rotorcraft pathway.

Apprenticeship/Trade		Trade Modules
Aircraft Maintenance Engineer – aeroplanes	*Turbine engine powered*	**1 – 9, 11,** 15 & 17
	Piston engine powered	**1 – 9, 11,** 16 & 17
Aircraft Maintenance Engineer – rotorcraft	*Turbine engine powered*	**1 – 9, 12** & 15
	Piston engine powered	**1 – 9, 12** & 16
Aircraft Maintenance Engineer	*Avionics Systems*	**1 – 9, 13** & 14
Additional training trade to obtain licences. *Avionics/Aeroplane/Rotorcraft*		**Licence Module**
Aircraft Maintenance Engineer –	Licence module	**10**

NB: Module 10 is at least 16 hours theoretical training in Europe.

The practical elements of the above trade skills, have not been promulgated in CASRs and associated Standards.

This is the dilemma that the NVET system has been confronted with.

Canada provides a 2-year full time *Diploma airframe, engine and electrical courses that are taught concurrently; approximately 50% of the time is devoted to practical and 50% to theory. Graduates having an attendance record greater than 95% are given 18 months credit, determined by Transport Canada, towards the experience requirements for an Aircraft Maintenance Engineer's Category "M" license.*

They also provide a one-year course covering structures repairs/modifications.

This system ensures the mechanical stream still includes structures even though the airlines employ dedicated "structures" maintenance engineers.

Summary.

Practical training, airline/non-airline, is different and the NVET system needs to adopt the broader skills required for the non-airline sectors whilst out-sourcing to the major airline sectors the responsibility to provide the practical skills applicable to the airline sector based on separated skills.

Australia's once creditable aviation maintenance training system has been negatively affected by CASA's push to 'control' education and impose "EASR Part 66 knowledge" system on a competency based system.

Where is the B3 and B2L LAME Proposal?

Without doubt, general aviation has suffered enough since CASA partially introduced the EASR Part 66/147. It now further complicates the future of general aviation by considering the A&P mechanic's Inspection Authorisation. What has happened to adopting and staying compliant with the EASR Part 66/147 that has now made major changes that would benefit GA. The 2018 revision of EASR Parts 66/147 introduces an amended B3 and B2L GA licencing system

What is the EASA B3 GA AME licence?

EASR Definition

(e) Category B3

The B3 licence is applicable to piston-engine non-pressurised aeroplanes of **2,000 kg Maximum Take-off Mass (MTOM) and below.**

This is the majority of general aviation aircraft and should have been adopted when CASA adopted EASR Part 66. 2,000Kg MTOW.

This B3 licence was part of the original CASA NPRM left out of the final decision. The Education Department had created applicable training package.

What is the Scope of the B3 licence?

Privilege

5. A category B3 aircraft maintenance licence shall permit the holder to issue certificates of release to service and to act as B3 support staff for the following:

— maintenance performed on aeroplane structure, power plant and mechanical and electrical systems; and

— work on avionics systems requiring only simple tests to prove their serviceability and not requiring troubleshooting.

This enables the LAME to sign the maintenance release to return an aircraft to service. To act as B3 support staff means when working in an AMO, they provide the quality control of maintenance performed by other LAMEs/AMEs.

However, the second dash point clarifies the scope of the B3 to perform quality control of avionics maintenance requiring simple tests but excludes troubleshooting.

Experience Requirements

Practical Experience

(g) For the B3 licence:

(i) the endorsement of the rating 'piston engine non-pressurised aeroplanes of 2,000 kg MTOM and below' requires demonstration of practical experience, which shall include a representative cross section of maintenance activities relevant to the licence category;

The limitations are the same approach used under previous regulatory systems.

The B3 should adopted immediately – but we now have to wait for the next Parliament because CASA missed their opportunity.

EASA Part 66 Endorsement.

Aircraft rating requirements	
Aircraft Groups	**B1/B3 licence**
Piston-engine non-pressurized aeroplanes of 2,000 kg MTOM and below	**(For B3)** **FULL RATING "Piston-engine non-pressurized aeroplanes of 2 000 kg MTOM and below"** based on demonstration of practical experience. **Limitations:** • Metal aeroplanes • Composite aeroplanes • Wooden aeroplanes • Metal tubing & fabric aeroplanes

Note: **OJT** means 'On-the-Job Training' (Appendix III to Part-66, Section 6) **and is only required for the first aircraft rating in the licence (sub)category.**

2. Modularisation Training – B3.

Qualification on basic subjects for each aircraft maintenance engineer licence category or subcategory shall be in accordance with the following matrix, where applicable subjects are indicated by an 'X':

This extract identifies the training modules associated to the B3 licence:

Subject Module	B3		
	non-pressurised aeroplanes of 2 000 kg MTOW and below		
1	X	7B	X
2	X	8	X
3	X	9B	X
4	X	10	X
5	X	16	X
6	X	17B	X

What is, Where is the EASA B2L GA AME Licence?

Basically, EASA introduced the B2L avionics licence for GA so an avionics LAME can obtain basic systems and expand the qualification as he/she gains experience in additional avionic systems.

(d) Category B2L

*The B2L licence is applicable to all aircraft other than those in Group 1 [*specific aircraft rating*] as set out in Point 66.A.5(i) and is divided into the following streams [*ratings*]:*

- *Communications/navigation (com/nav)*
- *Instruments;*
- *Autoflight;*
- *Surveillance;*
- *Airframe systems.*

A B2L licence shall contain, as a minimum, one system rating.

The reason that this licence is so compatible for Australia is that it brings back a career pathway that would address the shortage of avionics LAMEs, especially in rural Australia. A B2L with one rating would provide an entry pathway.

Another attraction would be employing LAMEs, especially in rural Australia, that could potentially have both a B3 and a B2L licence.

In fact, the NVET system had an unused 'mechatronic' training package that could be adjusted to provide the training for a combined B3/B2L licence with an "Airframe Systems" rating.

4. *A category B2L aircraft maintenance [engineer] licence shall permit the holder to issue [sign] certificates of release to service and to act as B2L support staff for the following:*
    - *Maintenance performed on electrical systems;*
    - *Maintenance performed on avionics systems within the limits of the system ratings specifically endorsed on the licence; and*
    - *When holding the "airframe system" rating, performance of electrical and avionic tasks within powerplant and mechanical systems, requiring only simple tests to prove serviceability.*

Adopting the latest revision of EASR Part 66 opens up a great potential for general aviation to at last have a LAME with the ability to meet the expectations of aircraft owners, especially in rural Australia.

EASRs cover the additional training/examinations to expand the B2L licence ratings quite clearly. The NVET system could add all system ratings as electives.

(c) An applicant for an aircraft maintenance engineer licence in category B2L for a particular "system rating", or for the addition of another "system rating", shall be demonstrate by examination a level of knowledge of the appropriate subject modules in accordance with Appendix 1 to Annex III (Part 66). The examination shall comply with the standard set out in Appendix II to Annex III (Part 66) and shall be conducted either by a training organisation appropriately approved in accordance with Annex IV (Part 147) or by CASA.

The B2L licence experience levels are:

- *3 years of experience, no formal training;*
- *2 years of experience plus training as skilled worker in allied trade;*
- *1 year of experience and approved formal training.*

For the addition of (a) new system rating(s) to an existing B2L licence, 3 months of practical maintenance experience relevant to the new system rating(s) shall be required for each system rating added.

Summary; EASA has provided a regulatory system that has many pathways to obtain an AME licence which our past regulatory system provided. The adoption of the latest EASR Parts 66/147 is fully recommended by AMROBA. In addition, a simple change to the EASR Part 66 to include the ICAO privilege for the LAME to certify as airworthy will complete the full circle.

Back to the Top