



Aviation MRO – ‘Skill’ Future

The skill needs of the aviation MRO industry has been one of the most debated subjects over the last couple of decades. Each operational segment of the industry, depending on their political muscle, has shaped the current system and those with less political muscle have found the system wanting for their segment.

Many affected (small) businesses, that should have been part of the debate, were not included and perceptions from some industry segments have not distinguished between the ‘skill’ needs for companies to operate within each sector of the MRO industry. This has only become apparent to AMROBA since we opened discussions with various government departments and agencies, some which have not been consulted with for decades, regarding classification of trades, shortage of government assistance with training and qualifications. This has highlighted the silo approach by government bodies and resultant problems for industry.

What is now becoming apparent is how this industry reacted to the expansion period of the 1960s and 70s and by doing so how it broke the nexus that previously existed between various government departments and agencies relating to recognition of trades both domestically and internationally for migrants. The one agency that has had the most influence on breaking this nexus is the Civil Aviation Safety Authority (CASA) in focusing skill needs to underpin the aircraft maintenance engineers’ (AME) licence not the skills needed to perform aircraft maintenance and/or manufacturing.

Fact – the CASA-issued aircraft maintenance engineers’ licence is not a permission to do maintenance – that is NOT the international rationale of the International Civil Aviation Organisation (ICAO) AME licence. ICAO Annex 6, Chapter 8 clearly states that “Australia” must establish maintenance personnel standards whilst Article 37, **‘Adoption of international standards and procedures’**, of the Convention requires Australia to undertake to collaborate in securing the highest practicable degree of uniformity in regulations, standards, procedures, and organisation in relation to aircraft and personnel in all matters in which such uniformity will facilitate and improve air navigation.

ICAO
Mandatory
Standards
“shall”

Annex 6. 8.7.5.3 The competence of maintenance personnel shall be established in accordance with a procedure and to a level acceptable to the State granting the approval. The person signing a maintenance release **shall be qualified in accordance with Annex 1.**

ICAO has stipulated the reason for issuing an AME licence for two purposes only. These purposes are specified as privileges in Annex 1, Chapter 4 of the Convention on International Civil Aviation commonly referred to as the Chicago Convention.

Annex 1. 4.2.2 Privileges of the holder of the licence and the conditions to be observed in exercising such privileges

ICAO
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4.2.2.1 Subject to compliance with the requirements specified in 4.2.2.2 and 4.2.2.3, the privileges of the holder of an aircraft maintenance licence **shall be to certify the aircraft or parts of the aircraft as airworthy after** an authorized repair, modification or installation of a powerplant, accessory, instrument, and/or item of equipment, and **to sign a maintenance release following** inspection, maintenance operations and/or routine servicing.

4.2.2.3 A Contracting State **shall prescribe the scope of the privileges** of the licence holder **in terms of the complexity of the tasks to which the certification relates.**

Globally, the person inspecting the completed maintenance to certify that the maintenance has left the aircraft or aircraft system airworthy is the person issued with an ICAO Annex 1, Chapter 4 AME licence – a licensed inspector holding trade qualifications appropriate to the scope of the AME licence or rating.

Basically, Australia, a contracting State that has ratified the Convention, must provide trade qualified persons that must, if Australia is to be a participant in the global aviation MRO industry, be trained to a similar standard as their European & North American counterparts; i.e. a broad based mechatronic AME supported by avionic specialists.

Many maintenance and manufacturing organisations are finding it difficult to participate in the global aviation industry because of acceptance of Australian work skills.

Government Bodies Involved with trade classifications

AMROBA research and consultation with many government bodies has confirmed that a whole-of-government policy or process has not existed for many years with regards to MRO skills. For instance, job classifications are set by the Australian Bureau of Statistics (ABS) in conjunction with New Zealand; the Department of Employment & Workplace Relations (DEWR) is the prime government body responsible for trade classifications and the Trade Recognition Authority (TRA) is responsible for approving trade classifications/qualifications. In addition, there is the Department of Immigration and Citizenship (DIC) that issues migrants with trade certificates based on equivalency to an Australian trade classification and of course, the Taxation Department has a role in providing relief with regards to apprentices, etc. Then there is the Department of Education, Science & Training (DEST) and their skill agencies like Manufacturing Skills Australia (MSA) and at last, but not least, there is the Department of Transport & Regional Services and CASA. Implementing training are government funded recognised training organisations that provide the training and skills to our workers. There are probably many other bodies and groups involved with the aviation MRO skill needs than what has been listed.

The problem, up till now, is that all these bodies have not been talking with each other to provide this industry with competent skilled maintenance personnel equivalent to their counterparts in Europe or North America. Aviation is, and has been for decades, a true global industry where job classifications must not only be seen to be similar to global standards but they must academically be as close as possible to their counterparts in other countries so that aircraft work done in this country can be accepted in other countries because we have globally recognised skills to do the work. This is a foundation block for any international trade agreement that the government and its agencies make with foreign governments.

To assist government in obtaining global recognition of the local industry is to give people skills that match the skills of workers used in Europe, Canada and the United States. They all produce similar syllabi and curricula for the avionic specialist and aircraft mechanic/engineer/technician, however identified. Any foreign country's system that is acceptable to these major players should be the system that Australia models its job classifications and qualifications of maintenance personnel.

Many of our members have had problems with competing in the global aviation market simply because government has no trade agreements with foreign trading countries that accept Australian manufactured and/or maintenance of aeronautical products. Until this happens, and industry has been waiting since the introduction of CASR Part 21 in 1998, Australian will be treated as a third world aviation MRO country.

Competency Standards

The introduction of competency based training, almost 2 decades ago, implemented trade streams that do not harmonise with the trade streams of North America or Europe. In addition, ever since the legislative requirement to hold an appropriate trade qualification prior to being granted an ICAO AME licence was repealed, Australia seems to have progressively lost mutual recognition by many (most) countries.

In other words, Australia's competency based training skills under the National Vocational Education Training (NVET) system must not only provide the skills to do maintenance and manufacturing tasks but, for the purpose of issuing a particular licence or rating, but be packaged so that the knowledge & experience to underpin the scope of each licence and rating is complete.

CASA's predecessor recognised the need to provide licences and ratings that were applicable to industry segments in the same manner as Europe & North America does today. However, when competency based training was introduced the connection with internationally recognised trade skill qualifications that originally underpinned the Australian MRO industry and the AME licensing system was severed.

When the National Aerospace Industry Competency Standards (NAICS) were originally introduced, pathways to trade skill standards were identified for airframe, structures, engines, electrical, instrument & radio trade skill levels – not licence levels. The separation of many 'structures' skills from the airframe category introduced a new uniquely Australian trade stream into the AME skills and converted the airframe category into a mechanical systems maintenance engineer. This system was mainly adopted in the airline segment although classifications such as aircraft sheet-metal workers have always existed in large and specialist maintenance & manufacturing organisations.

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The introduction of the NAICS trade streams created Australian unique trade qualifications that meant the Australian mechanical AME would no longer match the scope of the AME in America (A&P), Canada or Europe. Internationally, most aviation systems have aircraft maintenance tradespersons and avionic specialists. In addition, aircraft and aircraft systems manufacturer courses supplement the ongoing training of the tradesperson and the person licensed to certify the aircraft airworthy.

NAICS were not used for licensing pathways as CASA, and its predecessors, held Basic Examinations for each aircraft licence category and ratings. However, a decade ago, CASA initiated a review of the NAICS with the purpose of creating additional competency standards to address the skills of a LAME that were above the trade skill standards that had been in use, at that period, for a decade.

The purpose was to add skills (competencies) that would enable a LAME to exercise the ICAO licence privileges specified earlier. That is, to make a determination that the aircraft, or part of the aircraft, is airworthy after a repair, modification or installation of a powerplant, accessory, instrument, and/or item of equipment; and to sign a maintenance release after the aircraft has undergone inspection, maintenance operations and/or routine servicing.

The LAME privileges are only exercised applicable to the scope of the trade skills held. A qualified tradesperson cannot inspect the aircraft, or parts of an aircraft or aircraft system, and determine that it is airworthy – that is a privilege bestowed on the LAME. It is why the LAME globally does structural inspections to determine that the airframe is airworthy; it is why the LAME inspects the installation of components, completed repairs, flight systems rigging etc, to determine that the aircraft and/or its systems are airworthy. The LAME is the quality safety inspector.

To make a determination that an aircraft is airworthy then the term airworthy must be understood. In law, it simply means 'safe for flight' whereas, in aviation, it means that the aircraft continues to meet its design standards, including approved modification and repair design standards that have been applied to a particular aircraft.

The 'skill' required to sign the maintenance release means that the LAME would need to have 'work coordination' and 'maintenance management' skills so that a proper determination can be made that all the inspections, maintenance and/or servicing has been completed (signed) by appropriately qualified tradespersons and all documentation has been correctly completed.

Because CASA's predecessors had created various AME licences and ratings to meet the demands of the various industry segments it has now been recognised that the scope of each licence and rating has not been implemented as pathways through the NAICS. The latest amendments to the MEA06 training package provides pathways applicable to the airline industry but the next CIP version of MEA06 will include the non airline LAME pathways though these pathways will not be approved until 2008.

What is desperately needed is for the various government departments and agencies to provide national syllabi and curricula so that the Australian skill qualifications (trade certificates) harmonises with:

- European mechanical and avionic specialists
- US A&P and avionic specialists
- Canadian mechanical & avionic specialist

Government must make set global standards, irrespective of the interests of individual participants, in a manner that assimilates with Australia trade and apprenticeship systems so industry can attract school leavers into an industry that could once again be internationally recognised.

Industry cannot do the work of governments and their agencies – they must communicate and work together. It has been the lack of communication between governments and their agencies that prevents this industry from having true national classifications and qualifications.

Privileges and Scope of CASA ICAO AME Licences.

The scope of an AME licence or rating simply specifies the specific aircraft type, group of aircraft, aircraft avionic or mechanical systems that the trained & qualified LAME can determine as airworthy or the specific aircraft type or group of aircraft that the LAME can release to service. Annex 1, Chapter 4 clearly identifies how the scope of the licence or rating shall be specified.

Annex 1. 4.2.2 Privileges of the holder of the licence and the conditions to be observed in exercising such privileges

ICAO
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4.2.2.2 The privileges of the holder of an aircraft maintenance licence specified in 4.2.2.1 shall be exercised only:

a) in respect of such:

- 1) aircraft as are entered on the licence in their entirety either specifically or under broad categories; **or**
- 2) airframes and powerplants and aircraft systems or components as are entered on the licence either specifically or under broad categories; **and/or**
- 3) aircraft avionic systems or components as are entered on the licence either specifically or under broad categories;

Basically, ICAO has specified an AME licence shall have "aircraft" or "airframe-powerplant-aircraft systems" or "aircraft avionic systems" endorsed either specifically or under broad categories on the AME licence or other document. The scope of the mechanical AME licence stated above is for specific aircraft or groups of aircraft whilst the avionic systems AME licence is for specific systems or groups of systems.

A. ICAO Aircraft or Airframe/Engine & aircraft systems – Mechanical LAME

4.2.2.2 (a)(1) aircraft as are entered on the licence in their entirety either specifically or under broad categories

OR

4.2.2.2 (a)(2) airframes and powerplants and aircraft systems or components as are entered on the licence either specifically or under broad categories

AND

B. ICAO Aircraft Avionic Systems or Components – Avionic LAME

4.2.2.2 (a)(3) aircraft avionic systems or components as are entered on the licence either specifically or under broad categories;

ICAO also requires the AME licence holder to be familiar with all the relevant information relating to the maintenance and airworthiness of the particular aircraft for which the licence holder is signing a Maintenance Release, or which the AME licence holder is certifying as being airworthy such airframe, powerplant, aircraft system or component or aircraft avionic system or component

Most countries are now packaging their AME licences and ratings in a similar manner as the FAA A&P, IA and avionic specialist. Canada and Europe have packaged their AME licences and ratings in a similar manner but Europe, unlike Canada, has not yet come to terms with the non airline segment.

The problem that underpins the current NVET qualifications is that pathways have not been created to provide the MRO industry with qualified competent AME and AMT trade classifications that can be globally recognised. This is crucial when governments negotiate future trade agreements.

Australia's MRO industry environment created by governments and their agencies must enable our industry to compete on a level playing field with our international competitors. For too long this industry has been told by governments and their agencies that they are implementing changes to harmonise with global industry standards – it is time to deliver.

Business Skill Needs

The skills that MRO businesses need varies from the tradespersons doing work and the LAME that needs to make determinations. Many trade skill competencies are not needed for a LAME to exercise the licence privileges but many of these skills are required for a multi-skilled AME. This prioritising of licensing pathways has really negated the benefits to industry of NAICS that can be used to multi skill MRO industry workers. The ideal AME pathway would combine many current pathways to provide a worker with skills similar to their counterparts in Europe and North America.

Additional skills are required in specialist workshops irrespective to the licence or rating. Many employers want broader qualifications that have been provided under previous trade AQF 4 qualifications and to be able to further multi-skill their workers so that they can perform maintenance on wing and off wing.

Worldwide the AME is basically trained to work on aircraft, irrespective whether it is an aeroplane or helicopter, more broadly than what will be available under current pathways identified in the MEA06 training package.

If we look at the differences within AME skill needs, then it is easy to create segments.

1. Aeroplanes and helicopters are either designed with wood, metal or composite structures, or a combination of one or more – common core requirements.
2. Aeroplane and helicopter systems have many common systems but they also have specific flight control systems – common core & specific core requirements.
3. Aeroplane and helicopter piston engine variations are so little that they can be combined in one group - common core requirements plus manufacturer training.
4. Aeroplane and helicopter turbine engine variations are so little that they can be combined as common core requirements plus manufacturer specific training.
5. Aircraft and helicopter communication system variations are so little they can be combined as common core requirements plus, where applicable, manufacturer training.
6. Aircraft and helicopter instrument & electrical elements vary so little they can be combined as common core requirements plus, where applicable, manufacturer training.
7. Aircraft and helicopter navigation system variations are so little they can be combined as common core requirements plus, where applicable, manufacturer training.
8. Aeroplane and helicopter autoflight systems have many different requirements for their specific flight control systems – specific core requirements.
9. Aircraft and helicopter flight path computation systems vary so little they can be combined as common core requirements plus, where applicable, manufacturer training.
10. Specific aircraft, engine, propeller and appliance manufacturer training should be post competency training elements.

Recommendation:

That Government create an inter-departmental working group to address the harmonisation of trade skills within the aviation MRO industry to ensure that Australian trade classifications and qualifications harmonise with the classifications and qualifications of same tradespersons in Europe and North America.

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