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ADVOCATE OF THE AVIATION MRO INDUSTRY

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Civil Aviation Future is Electric!

Civil aviation is an industry that continues to change course as new technology is adapted or developed for civil aviation. This includes aircraft and components, support tooling/equipment and manufacturing techniques. It is why so many "get the bug" and are involved for all their lives. We used to laugh at the "**Jetson Cartoons**" but innovators are adapting these concepts.

Electrical powered small aircraft with an avionic system that will fly the aircraft to another location not requiring a qualified pilot.

Innovation overseas is modernising the concepts of personnel transport as well as commercial aviation. **Future Electric powered aircraft** are here, we need to prepare..

"**Jetson Aero**" is proposing a one-person electric aircraft that seems like one heck of a fun thing to fly. Its Jetson One aircraft is an "octocopter" with four arms stretching from its fuselage, each with a pair of rotors and a total output of 88 kW. This **personal air taxi** is categorised as an ultralight aircraft in the U.S. That means that it offers the freedom of flight with no pilot license required.

Eviation Aircraft '*Alice*' is aiming to complete type certification and service entry for its fixed-wing electrically powered aircraft by 2027. The company intends to certify ***Alice*** under the U.S. Federal Aviation Administration's Part 23 rules.

The "**eCaravan**" test flight was a success. The two companies behind it, **AeroTEC** and **magniX**, which supplied the electric motor, are chuffed with the results. **magniX** pointed out that the price of flying the Cessna clocked in at a mere $6 (£4.80). Had they used conventional engine fuel, the 30-minute flight would have cost $300-400 (£240-320)

You might also like:

- **The electric plane leading a revolution**
- **Norway's plan for a fleet of electric planes** by **2040 – all short-ops, electric aircraft**.

The first thing to note is that long-haul flights by large aircraft are not going to become fully electric any time soon. However, bio-fuels are fast becoming the next major change.

Pilotless Flight.

Reliable Robotics has reached a milestone in the development of its autopilot: FAA acceptance of the certification basis for the advanced navigation and autoflight system, which will eventually enable pilotless flights monitored by ground personnel.

The certification basis is for a supplemental type certificate (STC) to install the advanced autopilot in the Cessna 208 Caravan single-engine turboprop. Reliable Robotics expects to receive the supplemental type certificate in the second half of 2023.

The company is also exploring larger aircraft applications on the civil side, including Part 25 transport category certification.

More Items: (***Ctrl Click***)

1. Environmental Issues

"Aviation's sustainability is improving, the industry at large has made significant commitments to meeting market demands for greener flights. There is currently a myriad of technologies in development such as hydrogen propulsion engines, battery technologies (electric engines), and low-boom supersonic planes that will come to market in the future. Additionally, the demand for sustainability has already created new entrants to the market that will further innovate and make aviation accessible and sustainable to all."

Medium-term mitigation for CO2 emissions from the aviation sector can potentially come from improved fuel efficiency. Everyone is aware of bio-fuels being developed to replace jet fuel but replacement of Avgas has not been as successful.

SwiftFuel

FAA testing at the *William J. Hughes Technical Center* measured the Motor Octane Number (MON) of ***SwiftFuel*** at 104.1, higher than avgas and experimental non-leaded petroleum substitutes. In the final FAA report, it states: "On a volume basis, the Swift 702 fuel contained 13 percent more energy than the 100LL. Operation on the Swift 702 fuel resulted in an average decrease in volumetric fuel consumption of approximately 8 percent." *Interesting*.

When will such fuels be available in Australia?

A. Avalon Airshow.

The Avalon Airshow News link provides a view of what is on display. Some of new innovation on display is very interesting as are the defence products on display. This is the future of aviation – it will flow down into GA.

Australian International Airshow Aerospace and Defence Exposition 2023 (AVALON 2023) will be the fifteenth Airshow event held at Avalon Airport and will feature Australian and International aerobatic performers, a vast array of modern military hardware from the Australian Defence Force and overseas Air Arms, together with antique, classic, and experimental aircraft both in the air and on the ground.

AVALON 2023 fly in access not available. This is a major change for pilots wishing to fly their own aircraft to the event as Avalon East (YAVE), **the temporary grass strip runway familiar to many, will no longer be available.** With the non-availability of YMAV, pilots will have the opportunity to use the facilities afforded by ***Lethbridge Airport (YLED)***. Apart from using an established airport with both tarmac and grass runways, there will be a return coach service for Airshow Ticket Holders that will convey direct to the main entrance of the Airshow at Avalon. *Lethbridge Airport* will also be providing free camping at the airport for pilots and their passengers wishing to stop overnight or longer if required.

Drone manufacturer ***XSun Australia*** will bring its solar-powered uncrewed aerial vehicle (UAV) for static display at AVALON 2023. The company designs and manufactures autonomous and energy independent **UAVs with flight time of up to approximately 12 hours, and a range of up to 600km.**

The ***XSun UAV*** solution is designed to undertake automated missions in areas such as environment and civil safety, infrastructure and utilities networks mapping, law enforcement and military surveillance.

Back to the Front Page .

2. The MRO Skills Needed Now

MROs around Australia are looking for qualified maintenance personnel and LAMEs.

CASR Parts 66/147 have had a negative effect on the ability to attract, train and retain maintenance personnel. CASA is responsible for Annex 6 & 8 that specify AME training standards but do not apply those personnel trade training standards under Part 66.

- *The only difference between a qualified AME and a LAME is module 10 in Part 66/147.*
- *Module 10 is about certifying as airworthy, signing a maintenance release & managing.*

If this is the case, then why can't a CASA approved AMO authorise AMEs to certify maintenance tasks as they do in Europe and as was practiced in Australia for decades?

NB: *Within an AMO, those personnel required to undertake base maintenance tasks [qualified AMEs] and those that certify successful completion of maintenance [LAMEs] are required.*

Australia's cost effective skill system was based on this ICAO standard for many years.

Only government Departments/Agencies (CASA) can develop the 'regulations' and 'regulatory standards' changes needed to correct this sector's problems with attracting and retaining trade based skills.

Ever since the CARs were made in 1988, the decline in GA and pilots and AMEs/LAMEs started because of the regulations and standards introduced at that time and subsequent changes.

Government Failure

Government has not provided regulatory personnel training pathways that are ICAO compliant and internationally compatible to support the aviation maintenance sector.

Since the change from the Australian National Training Authority to the Australian Skills Qualification Authority, a whole of government outcome has not been achieved so NVET qualifications would align with the CASR Part 66 licence categories and sub-categories.

Issue: CASA has not promulgated personnel standards course curricula for each of their Part 66 AME licence categories and sub-categories.

CASA's role is to promulgate personnel standards, ASQA's role is to implement maintenance personnel training standards.

Issue: Without CASA promulgating trade curricula for each of its licences, the education sector has struggled to produce modular trade skills required by employers in all sectors of the aircraft maintenance system.

NB: Pre CAA/CASA, the Department provided those personnel underpinning curricula and the Education sector implemented them without further Department "approvals".

A. What is the purpose of maintenance?

To maintain aircraft as **airworthy** by maintaining the validity of the Certificate of Airworthiness, and

To maintain an aircraft as **serviceable** by provision of a maintenance release post maintenance.

Regulatory standards and intergovernmental collaboration is required so government can provide a regulatory framework and skilled workforce compatible with international obligations.

Industry can only operate within the regulatory framework provided by government.

If industry is not developing under the current regulatory system the government must make changes. This is now in the hands of CASA & Infrastructure to fix.

Back to the Front Page

3. Future Aircraft Need Futuristic Regulations?

Australia's aviation regulations are 15 years behind the USA and most other advanced nations. Civil Aviation Manufacturing and Maintenance Rules are 15 years out of date.

According to the World Bank, Australia ranks 14 under the "*ease of doing business*" segment. NZ is 1, US is 6, UK is 8 but EU countries are all in double figures. Mainly 20-70s plus.

Maybe these rankings suggest the US and UK 'aviation' regulations should be where we look for workable civil aviation regulations. The EU system does not ease the burden of doing business.

Our future civil aviation regulations must be ICAO compliant and modelled on the FAR system as originally intended post industry/government consultation way back in the late 1990s.

The failure to remain harmonised with ICAO by adopting world's best safe, effective standards that enable businesses to improve productivity is a responsibility of government..

Fact: In 1998, Government/CASA/ industry were committed to adopting the FAA manufacturing and maintenance regulations for the betterment of Australia's civil aviation manufacturing and maintenance businesses to compete in the global aviation markets as well as the domestic market. Still not completed.

Fact: Subsequent governments/CASA Executives have not continued that commitment. In fact, they have partially committed to adopting the EU civil aviation regulations. The result is the current system is neither compatible with ICAO or beneficial to our civil aviation manufacturing or maintenance sectors. Not conducive to other nations trade agreements.

Fact: In the late 2000s, the FAA reviewed their regulations to enable their manufacturing and maintenance businesses to better participate in the global aviation manufacturing and maintenance markets by reducing red tape and clarifying industry responsibilities for their own designs, manufactured products and maintenance.

The FAR amendments in the late 2000s and on have been beneficial to their civil aviation manufacturing and maintenance businesses.

- Australian Aerospace manufacturing is a success but Civil Aviation manufacturing is not.
- Civil aviation maintenance, without international recognition, is not a success.

Practical FAR Changes

You only have to view the change in the Title of FAR Part 21in 2009 to understand the change in approach throughout FAR Part 21.

- **FAR PART 21:** Certification Procedures For Products And Articles
- **CASR Part 21: C**ertification and Airworthiness Requirements For Aircraft And Parts

Note: Aeronautical "**products**" globally includes 'aircraft' except Australia, uniquely, removed 'aircraft' from the definition of product in the Civil Aviation Act. To the rest of the world, 'product' includes 'aircraft' – we need to harmonise.

Note: Because of the changing regulatory direction & changes over the last 15 years, CASR Part 21 has to retain Subpart J & M, though both these subparts need amendment.

ICAO Annex Changes

There has been numerous changes to the Annexes that are applicable to manufacturing and maintenance. The government allocates the government departments and agencies responsible for meeting Australia's obligations under those Annexes. Annexes 8, 6 & 1 are allocated to CASA.

AirServices Australia list the Differences that have been lodged with ICAO.

Back to the Front Page