The ADF is transitioning to a European-based Defence Aviation Safety Regulations framework for its system of military airworthiness

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The regulation of Australian military airworthiness is about to undergo its biggest change since the early 1990s. The successful, but uniquely Australian airworthiness system that emerged in the wake of a calamitous series of crashes is, after 20 years, to be replaced by a European-based system known as Defence Aviation Safety Regulations.

Perhaps surprisingly, or not, Australia is taking a leading role in the implementation of an airworthiness system developed on the other side of the globe.

Airworthiness regulations, unlike the accidents they help prevent, rarely make the news. And while this fact sits happily with those charged with ensuring safe military flying, there is a deeply felt need to communicate both the scale and the benefits of the new regulatory regime.

With that in mind Australian Aviation travelled to RAAF Williams in Victoria to speak to Directorate General Technical Airworthiness – Australian Defence Force (DGTA-ADF) about the process of rolling out a new airworthiness system across three services.

AIRWORTHINESS DEFINED

For the ADF airworthiness is defined as: “A concept, the application of which defines the condition of an aircraft and supplies the basis for judgement of the suitability for flight of that aircraft, in that it has been designed, constructed, maintained and operated to approved standards and limitations, by competent and authorised individuals, who are acting as members of an approved organisation and whose work is both certified as correct and accepted on behalf of Defence.”

The system for the management of safety in military aviation domain is provided by the Defence Aviation Safety Program, or DASP.

The DASP is administered by three agencies, the Airworthiness Coordination and Policy Agency (ACPA), DGTA-ADF and the Directorate of Defence Aviation and Air Force Safety (DAAAFS).

In practice, the DASP is managed by the Chief of Air Force in his role as Defence Aviation Authority (DAA), and is accountable as such to the Chief of Defence Force.

The Deputy Chief of Air Force (DCAF) is the Operational Airworthiness Regulator (OAR) and publishes the operational airworthiness regulations in the ADF Operational Airworthiness Manual. Compliance with the manual ensures that aircraft are operated in approved roles, with correct mission equipment, by authorised and supervised personnel in accordance with procedures and instructions.

Lastly, the CDF appoints the DGTA as the Technical Airworthiness Regulator. As defined by the manual, the TAR is responsible for “establishing and maintaining the regulatory framework for the design, construction and maintenance of ADF aircraft and aviation systems. This includes the authority to prescribe, interpret, and revise airworthiness design standards.”

Put another way, technical airworthiness ensures that aircraft are designed, constructed and maintained to approved standards by authorised individuals, using approved data and working within approved organisations under a system of certification and acceptance.

“The operational airworthiness framework is one of three elements that comprise the ADF Aviation Safety...
AIRMSHL Davies then stressed the following: “It is essential that you understand operational airworthiness within the ADF and its contribution to the generation and maintenance of military aviation capability. Simply put, operational airworthiness is a concept that contributes to the generation and maintenance of an effective military aviation capability. It ensures that Service commanders are more able to fully exploit the capability to achieve their operational objectives – it enhances mission accomplishment.”

THE CASE FOR CHANGE

Military flying in Australia is governed by an extensive suite of design and maintenance regulations that were progressively introduced after 1993, in the wake of an eight-year period that had seen 22 fatal crashes of ADF aircraft (and six in 1991 alone).

The effect of these regulations is reflected by the immediate and precipitous drop in fatal accidents following their adoption – since 1993, there have been six fatal accidents involving Australian military aircraft, a figure all the more remarkable given the high operational tempo of the ADF since 2002.

Though having undoubtedly served Defence well, ever-growing participation in coalition operations, globalisation, increasing commercialisation and the difficulties of mutual recognition between partner nations’ airworthiness authorities have all undermined the case for a bespoke airworthiness regulatory system peculiar to Australia.

Therefore, there are a number of benefits to Defence in aligning airworthiness regulations with those of the region and coalition partners.

Aligned regulations will enable the ADF to benefit from efficiencies of global supply chain and maintenance arrangements, especially for the increasing number of civilian-derived aircraft being operated by Defence (and the RAAF in particular), and will allow commercial organisations to exploit blended military/civilian support arrangements without the constraints of different regulatory systems.

Another benefit is the mutual recognition of approvals and certifications provided by other military and civilian airworthiness authorities for common aircraft types, which will enable the ADF to conduct combined operations with regional and coalition partners rather than discrete Australian operations.

Blended technical workforces for aircraft maintenance, ie Australian military and foreign military, or Australian military and civilian personnel, is another benefit.

Finally, aligned regulations can allow improvements in aviation safety arrangements to be taken advantage of that cannot currently be easily incorporated into the existing regulations, again helping to reduce aircraft sustainment costs.

DGTA notes that current regulations were very effective but in some cases 30 per cent more expensive in regulatory overheads compared with ICAO-based regulations. And so, while successful, Australia’s ponderous military airworthiness regulation system risks being marooned as partner nations and allies migrate to a common system.

“A review of the Australian system by DGTA-ADF highlighted some unnecessary contracting costs caused by our current regulations that don’t improve safety,” WgCdr Jason Dean of the Directorate of Aviation Regulation explains.

EMBRACE THE NEW

In 2012, DGTA undertook the study of extent, ICAO-based aviation safety frameworks upon which to base Australia’s new DASR.

The US military’s airworthiness system – overseeing four separate air arms – was rejected on grounds that it does not constitute a single regulatory regime.

The sheer magnitude of each service, their operations and cultural differences means that modelling off the US military would be impractical, DGTA found.

Likewise, adopting the United Kingdom’s airworthiness structure was ruled out by virtue of it being a bespoke framework, and one developed in haste in the aftermath of 2006’s midair explosion of Nimrod XV230. It was, however, acknowledged as providing a good example of an ICAO-compliant airworthiness regime that Australia would do well to learn from.

Eventually, DGTA settled on the European Defence Agency’s European Aviation Safety Agency (EASA)-based model, whose emerging convention for aviation safety makes possible an increasingly standardised approach to civil aviation.
“Global aviation safety regulation enhancement occurs most rapidly in civil aviation,” Director General Technical Airworthiness, AICDDRE James Hood, explains.

“Regulators have always needed to balance the needs of civil aviation across a wide variety of business contexts and configurations, against the accepted level of safety performance.”

The European Defence Agency has borrowed heavily from these EASA regulations, militarising them where necessary and publishing them as European Military Aviation Requirements (EMAR). These, in turn, are to be adopted almost wholly by the ADF, modified only where necessary for Defence and promulgated as the Defence Aviation Safety Regulations (DASR).

EMAR features an airworthiness regulatory regime that is 95 per cent common with EASA’s, is contemporary and ICAO-based, is hazard and outcomes-focused, promotes interoperability and mutual recognition and is designed for multinational adoption.

According to AIRCDRE Hood, there were several compelling reasons that the European model was chosen.

“The EMARs are not too dissimilar to the current technical airworthiness regulations, and they offer all the benefits we are looking for in our next iteration. Australia has been pursuing excellence in aviation safety for 20 years; we have the talent in our people to implement the new DASR in a controlled manner; we have the expertise to lead the implementation of EMARs in our region and influence future development of EMARs by the European Defence Agency; and we see DASR as being consistent with Defence’s pursuit of excellence in aviation safety.”

EASA DOES IT

The use of common language in the EASA regulations is another key benefit of adopting the European Military Aviation Requirements.

“Presently, when militaries work with each other, there is a significant language barrier because, up until now, our systems have used unique terms and unaligned policies that make understanding each other difficult. Using a common language to talk about airworthiness that is already widely understood through the civil aviation community will improve understanding, making communication with allied forces more efficient and user-friendly,” WGCDR Dean explains.

“Aside from having unique airworthiness policies, the Australian Defence Force uses some of the same terms that are used by other militaries, but in different ways, which often creates confusion. EMAR 21 Initial Airworthiness uses some of the same terms that are used by other militaries, but in different ways, which often creates confusion, it’s like calling a flap a slat and both parties not knowing any better.”

Current planning calls for EASA’s flat regulation structure to be transposed onto DASR, which will include functional regulation of initial airworthiness and continuing airworthiness (DGTA-ADF’s remit), aircrew, air operations, air navigation services, rules of the air and aerodromes (ACPA’s remit).

The most significant changes involve the regulation of continuing and initial airworthiness. Existing Australian military aviation, operational airworthiness and technical airworthiness regulations (the so-called MILAVREGS, OAREGS and TAREGS) will be ‘mapped’ onto the DASR framework.

The principles of EMAR’s common approach to military airworthiness is outlined in the European Harmonised Military Airworthiness Basic Framework Document, and broken down into five initial and continuing airworthiness requirements.

» EMAR 21 Initial Airworthiness – establishes criteria for the certification of military aircraft and related products, parts and appliances and design and production organisations. It details the requirements related to the certification of either a new type or a change to existing type, its design and related activities.

» EMAR M Continuing Airworthiness Requirements – establishes the measures to be taken to ensure that airworthiness is preserved, including maintenance.

» EMAR 145 Maintenance Organisations – establishes the requirements to be met by an organisation to conduct maintenance on aircraft and components.

» EMAR M6 Military Aircraft Maintenance Licensing – establishes the education and training requirements for aircraft maintenance personnel.

» EMAR 147 Aircraft Maintenance Training Organisations – establishes
the requirements to be met by organisations seeking approval to conduct aircraft maintenance training and examinations.

“Work is underway to identify equivalency between other nations including the US to enable improved communications and exchange of services. Importantly, this equivalency will be based on the same principles adopted by Australia – the EMARs,” WGCDDR Dean says.

IT TAKES TWO
The wholesale changes being embraced with DASR will mean that its rollout needs to be carefully managed to ensure the ongoing integrity of Australian military airworthiness regulation.

“Phase 1 is a low risk, low benefit approach,” AIRCDRE Hood outlines. “Organisations will initially migrate to the DASR with minimal impact to existing management, plans, contracts and organisational structures. This phase offers a controlled transition in which the [military aviation] community can be fully educated on the DASRs, while protecting the arrangements that have assured safety under the current regulations. The pace of transition can be quick and offers certainty that key organisations ‘cut over’ at the same date to maintain integrity of the new safety assurance framework. That way, the cost of implementation both human and financial is minimised.”

Phase 2 of implementation is defined as low risk and high benefit. AIRCDRE Hood continues, “Organisations can then exploit the flexibility and efficiencies afforded by the DASR in a manner and rate that is sensible to their unique circumstance. And, having preserved the level of current safety offered by existing arrangements, and achieved initial compliance to the new DASR, organisations can then explore and exploit the flexibility and efficiencies offered by DASR, in combination with other changes occurring across Defence, and develop integrated plans that can be properly resourced by their organisations.”

ACROSS THE DITCH
Australia is not unique in the region in seeing the upside to a globally-common military airworthiness regulatory system.

“Our bilateral collaboration with the NZDF and through international airworthiness working groups has led to a realisation that as a small nation force, we have to make our international engagement simpler,” WGCDDR Dean points out. “Oceania will soon have a new military airworthiness construct and there is a desire to extend it into South-East Asia to benefit other small nation forces in the region.”

“Militaries across the world are realising that it is not feasible or desirable to maintain independent systems, and aligning with civil aviation requirements is a natural progression. This is what we are seeing throughout Europe and now within Australia and New Zealand.”

Australia’s progress in introducing EMARs is being watched closely by regional and European air arms, with the ADF, ironically, emerging as a world leader in the implementation of European military airworthiness regulations.

Indeed, it is conceivable that once regional air arms decide to align with EMARs, opportunities for maintenance of common platforms, or design or information exchange may arise, thanks to a greater standardisation of regulation and terminology.

LEGACY
AIRCDRE Noel Schmidt is acknowledged as AIRCDRE Hood as the ‘father’ of the current regulatory system, and there are, doubtless, many military aviators flying today who owe him and his team their lives.

Nonetheless, the now-retired Schmidt is a staunch proponent for change. He recalls: “We have made many advances since our first Airworthiness Board in May 1991. Back in the early days, very few of us really understood the full range of issues that comprise ‘airworthiness’. Australia led the thinking on this among many of our military partners. Since developing our first technical regulations in the mid-1990s, we have pursued many incremental improvements which also expanded to cover operations in the early 2000s.

“Looking back, it is great to see an entire new generation of highly expert engineers and operators who now simply accept our airworthiness system as being a safe and smart way to operate.

“However, with the significant developments in recent years of a comprehensive European regulatory set, now covering both civil and military aviation, which is being increasingly adopted by many of our international partners, it is time for us to evolve our system in pursuit of excellence in safe military aviation.”