DEFENCE MILITARY AIRCRAFT MAINTENANCE LICENSING AND ASSOCIATED MAINTENANCE TRAINING UNDER DASR-66/147

Air Vice Marshal Noel Schmidt

28 November 2023

Obj Ref: BP37553386

**SENIOR EXECUTIVE REVIEW into
DEFENCE MILITARY AIRCRAFT MAINTENANCE LICENSING
and associated MAINTENANCE TRAINING under DASR-66/147**

EXECUTIVE SUMMARY

Introduction

1.   This Review was commissioned by Director General Defence Aviation Safety Authority (DG DASA) in February 2023 approximately 5 years after the introduction of the Defence Aviation Safety Regulations (DASR) Part 66 (Maintenance Licensing) and Part 147 (Maintenance Training). The purpose of the Review, as outlined in the Terms of Reference (TOR) at Annex A, was to assess the implementation of DASR-66/147 across DASA and the regulated community, to confirm the overall value proposition of Military Aircraft Maintenance Licenses (MAMLs) and, where appropriate, make recommendations for improvement. In doing so, the Review was to consider opportunities to further mature DASR-66/147 in the Defence context including maintenance workforce and training improvements.

2.   When commissioning the Review, DG DASA recognised the diverse range of perspectives, levels of understanding, implementation progress/success and overall satisfaction with DASR-66/147 across the regulated community and sought to improve future DASR-66/147 outcomes for Defence. This variation in experiences, perspectives and outlooks relating to DASR-66/147 was a consistent theme across the consultation phase of the Review.

3.   The Review was completed over a nine-month period and included extensive analysis of materials spanning pre-decision by Air Force Headquarters (AFHQ) circa 2013, due diligence by DASA from 2015 onwards and the implementation phase from 2017 onwards. In addition, the Review Team (RT) conducted wide-ranging consultation across the entire regulated community and within DASA, as outlined in the list of personnel consulted at Annex B.

4.   This report provides our findings across four parts:

  a.   Background,

  b.   DASR-66/147 implementation by DASA,

  c.   DASR-66/147 implementation by the Services and Defence Industry, and

  d.   DASR-66/147 operating in national/international contexts.

5.   The purpose of the Review was not to propose revocation of DASR-66 or DASR-147 unless the regulations were found not to be credible or defensible, and a more suitable international competency standard was available at an acceptable return on investment for Defence (Annex A). We did not find any of these conditions to exist. Hence we support continuation and increasing alignment to DASR-66/147 (which is an adaptation of EMAR-66/-147) as an integral element of a mature, interconnected DASR system.

6.   While we support continuation of DASR-66/147, we found significant opportunity, and need to improve the implementation of DASR-66/147 within Defence. Attention to these opportunities will enable greater realisation of the benefits that full implementation of DASR-66/147 offers, while avoiding the potential detriments that are clearly being felt, to different extents, across the regulated community. Importantly, we find that Defence is beyond a 'tipping point' where the investment already made in the DASR-66/147 migration, coupled with astute

investment in the near term, including attention to the observations and recommendations in this report will start to yield the long-term benefits that DASR-66/147 alignment offers.

Part 1 – Background

7.   There is an intrinsic link between aviation regulations, training, and workforce structures which makes appreciation of historical initiatives to optimise Defence Aviation outcomes through structural and other reforms, beneficial background to this Review. Defence Aviation has appropriately sought continuous improvement to efficiency, effectiveness, and safety dating back to the Technical Trades Restructure (TTR) of 1990 and prior. The TTR addressed a divergence between existing trade structures, technology of the time, and upcoming aircraft acquisitions. To realign trade structures with the contemporary (and future) operating environment, the TTR amalgamated six trades into two (Aircraft and Avionics), introduced self-certification, platform alignment, multiple skill levels, and Self Supervising Technicians (SSTs).

8.   In 2013, the Maintenance Productivity Improvement Program (MPIP) focused on reducing the size of the maintenance workforce to provide offsets to accommodate new Air Force capabilities. MPIP improved maintenance policies relating to self-certification, single signature tasks and Independent Maintenance Inspections. In parallel, Army conducted maintenance reform through Plan Pelican with similar aims.

9.   Whilst the above initiatives yielded some productivity gains, there was little focus on underpinning trade structures and corresponding maintenance training, which limited, to an extent, the benefits realised over time. We have found that *appropriate* alignment of training and workforce structures to the DASR-66/147 model is a key enabler for realising the long-term benefits of DASR-66 /-147 through an integrated, holistic regulation-training-workforce system of systems. A*ppropriate* alignment depends on operating context, and in the Defence context, may vary between the Services, so long as workforce structures and training are aligned to extract maximum value, with regard for the requirements, and opportunities of DASR-66/147. Opportunity exists to leverage lessons from past improvement initiatives by aligning the underlying training and trade structures to the new operating model to unlock the full benefits of DASR.

10.   The 'total system approach' to regulation, training and workforce structure featured strongly in the DASR 'mandate for change' at AFHQ level in 2013. Following the Air Force Board (AFB) decision to implement DASR, significant due diligence was undertaken by DGTA/DASA which included an assessment that Defence should *adapt* EASA Maintenance Training and Licensing regulations (Parts 66/147), which was a '*moderate*' implementation strategy - compared to other parts of the EASA regulation suite (Engineering and Maintenance: '*maximum*' and Flying Environment: '*minimum*').

11.   We find that ongoing *adaption* of DASR-66 (as distinct from *adoption*) presents the best opportunity for Defence to optimise maintenance support to aviation operations under DASR-66/147. We also find that any perceived downside of *adapting* (ie, tailoring) DASR-66/147 to best meet Australian Defence needs is now somewhat reduced by the variable, and indeed lesser, than expected international *adoption* of European Military EMAR. This means the balance between aligning to a consistent international approach to EMAR-66/147, versus *adapting* EMAR-66/147 to the best DASR-66/147 design for the ADF, should swing towards the latter due to reduced benefit of the former.

12. Defence implemented DASR-66/147 (an *adaptation* of EASA-66/147) as part of the broader DASR implementation with an expectation that it would improve capability and safety. DASR-66/147 offers these improvements through a direct link between training outcomes and certification privileges, a focussed accountability for the certification of maintenance, and enabling a single trade to certify for the removal and installation of the majority of all aircraft components. We have found a clear and direct relationship between the benefits being realised by operating organisations, and the extent to which the organisation has been able to align training and workforce structures to the DASR-66 framework.

Part 2 - DASR 66/147 Implementation by DASA

13. Five key themes emerged during our examination of the DASA contribution to DASR-66/147 implementation. The five themes were tested and verified through consultation with the regulated community and extensive literature review. In presenting these themes, we wish to acknowledge the work and due diligence undertaken by DASA and the regulated community alike since the decision in 2013; this work has been critical to the progress made to date and will remain so as the DASR system matures toward a steady state. The five themes are:

    a. Lack of clarity and inconsistency in the use of language in DASR (Parts 145, 66, 147);

    b. Lack of clarity in DASR-145 and a narrative to differentiate between 'supervising' and 'certifying' maintenance activity;

    c. Lack of a wider narrative to relate key new terms introduced by DASR-145/66 to previous well understood maintenance terminology and concepts under TAREGs;

    d. Major complexity, delays and inefficiencies with the assessment, initial issue, and update of DASR-66 Licenses (i.e., MAMLs); and

    e. Management of Deferred Defects.

14. On the above five themes, the Review makes recommendations aimed at improving the clarity and understanding of DASR-66/147 language and terminology; providing a wider narrative to support improved interpretation and application of the Regulations; improving MAML application/issuing workflow and throughput; and improving consistency and efficiency in the management of deferred defects.

15. In addition to the above five themes, two noteworthy issues were identified, on which specific recommendations are made to assist with maturation of the DASR-66/147 implementation in the Defence context. These issues are:

    a. Alignment of MAML Exclusions /Inclusions to Maintenance data structures, and

    b. The age restriction (21 years) for 'Certifying staff'.

16. In line with the above themes and noteworthy issues, Part 2 includes a number of observations which focus on a need for clearer communication and education on DASR-66/147 requirements and opportunities as well as a need to resource the high level of effort required to manage the MAML license assessment and issuance process.

Part 3 – DASR-66/147 Implementation by ADF and Defence Industry

17.   The dominant, and most important theme for examination in this part (per TOR 12b (iii)) was '*…issues and constraints limiting the realisation of benefits as intended by the Air Force Board's deliberate decision in 2013 to introduce DASR66 and DASR147*'. With this focus, six major themes related to areas presenting significant challenges, or opportunities for wider exploitation and adoption, emerged:

   a. Recognition of foreign/ex-ADF military maintenance technicians under DASR-66,

   b. Lack of alignment of IET and some P-IET with DASR-66 requirements,

   c. Lack of alignment of current aviation trade structures with DASR-66 licenses (particularly Air Force trades, less so with Army and Navy),

   d. DASR-66 Licenses for Specialist Trades – ARMTECH and ASTTECH,

   e. DASR-66 Implementation in Navy, Army, and Industry, and

   f. Status and Maturity of DASR-147 MTOs.

18.   Examination of the above six major themes revealed important opportunities for improvement and maturation in the Defence context and the report makes strong recommendations in these areas aimed at:

   a. Improving consistency and repeatability in 'onboarding' foreign trained technicians and better understanding UK MAA processes to streamline onboarding of UK trained technicians,

   b. Improving operational efficiency and individual lived experience of 'specialist trades' through better integration of these trades into the DASR-66/147 system,

   c. Improving cooperation with Industry on removal of specific MAML exclusions where appropriate, and beneficial to Defence,

   d. Resourcing and supporting the Army Aviation Training Centre with an existing initiative to establish an RPL process with ADF-wide benefits to better streamline the recruitment and training of UK lateral recruits,

   e. Sustaining the positive DASR-66/147 progress within Navy, Army, and Industry (in unique, yet appropriate ways) and using the lessons available to support other areas of Defence to make progress aligned to Service needs,

   f. Continuous improvement of governance of the Air Domain MTO,

   g. Improving alignment between IET and FEG delivered post-IET where necessary, and

   h. Improving CAMM2 training and courseware.

Part 4 – DASR-66/147 Operating in National/International Contexts

19.   One of the most important observations from this Review is that unlocking the benefits of DASR-66 in the international context has proven more challenging than anticipated prior to implementation. We observe that EMAR is not applied uniformly and discontinuities between different Nations will require on-going effort to achieve anticipated benefits in what is likely to remain a dynamic international environment.

20.   We also observe overly optimistic expectations prior to DASR-66 implementation, particularly that international recognition between allies (especially UK/US military) would be

seamless, or even effortless. These expectations have not been realised for a variety of reasons, including that the UK/US have not shifted their education system to accommodate EMAR/DASR-66. This does not make DASR-66 incompatible with the UK/US systems, it just means that repeatable processes for assessment need to be developed, understood, and resourced.

21. With respect to rapid mobilisation and routine workforce supplementation, we see opportunities for Defence to employ 'non-aviation' trades who have undergone lower-level training to perform (not certify) defined tasks. DASR-66.A.30 provisions provide potential for such persons to eventually gain a MAML. We make a recommendation to pursue this opportunity in ways appropriate to individual FEGs.

22. In the national context, we identify two CASA initiatives with potential to enhance DASR-66/147 outcomes for Defence. The first is a modular self-study pathway to achieving a License which we assess to be worth considering as Defence continues to optimise training pathways to MAMLs. The second was some detailed CASA AMC/GM that defines a 'skilled worker in technical trade' which enables earlier Licensing outcomes with respect to the amount of practical experience required to qualify for a Licence. We make a recommendation that DASA provide comparable GM for DASR-66.A.30(a) to provide greater flexibility for the Services and Industry as they continue to optimise their training and workforce designs to extract the full benefits of DASR-66/147.

Conclusion

23. We conclude that DASR-66/147 and the associated MAML system are appropriate, and necessary components of a healthy, mature, outcomes-based regulation set for Defence. We note that some aspects of realising DASR-66/147 are currently imperfect and require targeted further effort by DASA and the regulated community to achieve their full potential benefit through optimised training, licensing and workforce structures.

24. DASA and significant portions of the regulated community have responded admirably to the challenge of implementing DASR-66/147 in the interests of efficient and effective Defence Aviation operations. Targeted work still remains to be done to realise the full benefits, but the collective community is on the right path. Action to address the observations and recommendations in this report will assist in reaching optimal outcomes.

25. We find that implementation of DASR-66/147 is 'beyond the tipping point' - that is, revocation of DASR-66/147 now, or in the near future would create more disruption, incur more cost, waste much of the significant investment to date, and be conducted without evidence of an alternate bespoke path to generate improved safety and/or operational outcomes for Defence.

Index of Parts / Major Themes

Annexes:

A. Terms of Reference

B. List of personnel consulted

C. Technical Trades Restructure (TTR) Outcomes

D. Some relevant unfiltered comments from Interviews and Feedback

E. UK Military Maintainers UK MAA Authority Level Authorisations – in an Australian DASR-145 context

F. UK MAA Plans to use Part-66 and 147

**SENIOR EXECUTIVE REVIEW into
DEFENCE MILITARY AIRCRAFT MAINTENANCE LICENSING
and associated MAINTENANCE TRAINING under DASR-66/147**
by
AVM Noel Schmidt – 28 November 2023

INTRODUCTION

1.   In 2016, the Defence Aviation Safety framework was updated with the aim of aligning it to a contemporary, internationally recognised and ICAO-compliant aviation regulatory system. An update was also required to comply with the strict requirements of Australia's *WHS Act 2011*. This led to the Defence Aviation Authority (Defence AA) approving establishment of the Defence Aviation Safety Authority (DASA) and Defence Aviation Safety Regulations (DASR) to assure the airworthiness and safe operation of State aircraft and comply with statutory WHS obligations.   The new DASR suite is based on a combination of a military derivative of European Aviation Safety Agency (EASA) regulations – termed 'European Military Airworthiness Requirements' (EMARs) - and also previous Operational Airworthiness Regulations (OAREGs). The new DASR suite also sought to benefit from perceived increased levels of interoperability with allied nations flowing from recognition agreements between National Military Aviation Authorities (NMAAs) for certification of aircraft design, production and maintenance.

2.   Rollout of the new DASR suite commenced on 30 Sep 16. The new DASR suite included a number of parts covering the traditional management of technical and operational aspects of military aviation. Importantly, and in the context of this review, it included three parts specifically related to aircraft maintenance - these being requirements for:

   a. aircraft maintenance organisations (DASR-145),

   b. licensing of maintenance technicians (DASR-66) – in June 2017, and

   c. aircraft maintenance training organisations (DASR-147) – in October 2017.

Although this review focuses only on the implementation of DASR-66 and DASR-147, it also requires examination of how DASR-66 is applied in a DASR-145 maintenance organisation (MO) and how DASR-147 training requirements are applied.

3.   When DASR-66 was introduced, transitional arrangements were initially established to allow the continued use of legacy maintenance authorisations and provide some relaxation of evidence required to gain a Military Aircraft Maintenance License (MAML). These 'grandfathering' arrangements ended in March 2020. During recent years, a range of issues have been cited by both ADF and Industry aviation maintenance communities raising doubts about the claimed safety, efficiency and productivity benefits. This has led to considerable negativity over the way that DASR-66 has been implemented. DG DASA suspects that, based on evidence from the civil sector, this negative narrative does not appear justified when looking at potential benefits to be gained from implementation of the whole system. This also assumes correct coupling with the right workforce and training system. Hence, in the spirt of continuous improvement, DG DASA requested an independent review of the implementation of DASR-66/147 be conducted by AVM Noel Schmidt, with assistance by three staff collectively referred to as the Review Team (RT)[1].

---

[1] Review supported by GpCapt Rob Crowe. Further limited input from AirCdre James Hood (Apr-Jun23) and Mr Heath Smith (Oct-Nov23). Collectively referred to as the 'Review Team' (RT).

4.   **Task.** A copy of the Terms of Reference (TOR) is provided at **Annex A.** Specifically, the RT was tasked (per TOR para 12) to review the implementation of DASR-66/147 separately by DASA and by the regulated community (ie, Services and Industry), as well as examining potential further benefits/detriments of DASR-66 alignment with international or domestic aviation safety authorities. The Review was not expected to propose revocation of DASR-66/147 unless compelling arguments existed, and a more suitable international competency standard is available (TOR para 11). Rather, the Review was expected to confirm the overall value proposition of MAMLs issued under DASR-66 and provide a number of recommendations for improvement.

5.   **Method.** The RT initially examined an information pack of documents prepared by DASA staff covering a wide range of matters on this topic. This was followed-up by interviews with specialist DASA staff along with a series of focus group sessions conducted in four regional visits. This included engagement with many executive and management staff as well as technicians from ADF Force Element Groups (FEGs) and Industry maintenance organisations (DASR-145), Continuing Airworthiness Management Organisations (CAMO) (DASR-M), aviation Maintenance Training Organisations (MTO) (DASR-147) and other national civil and military airworthiness authorities. A full list of locations visited, and personnel consulted during the review is at **Annex B**.

PART 1 – BACKGROUND

6.   The RT considered the most efficient approach was to structure this report in four parts. Three parts will address each of the three topics as defined in the TOR Scope para 12, i.e., *'DASR66/147 Implementation by DASA', 'DASR66/147 Implementation by the Services and Defence Industry', and 'DASR66 operating in national and international contexts'*. However, before moving into the first topic and, noting the significant change that DASR-66 has imposed on the aviation maintenance workforce since 2017, we consider it worthwhile briefly reviewing some **previous attempts to optimise workforce structure** as background. This will assist in providing context to comments (albeit limited as explained later) in response to key elements of TOR para 12b (ie *workforce design, mobility and training)* which will consider the adequacy of current workforce structure/design along with education and training issues. Secondly, we considered it also important to review the '**Mandate for change'** to be able to comment appropriately on DASA's implementation and, more specifically, TOR para 12b(v) which will examine '*issues and constraints limiting the realisation of benefits as intended by the Air Force Board's deliberate decision in 2013 to introduce DASR-66 and DASR-147'*.

7.   The collection of DGTA research papers and Briefs discussed in this Part provide a significant examination of issues and challenges associated with any initially proposed attempt to **adopt,** in full, EMAR-66/147 for the licensing of technicians maintaining ADF aircraft. The brief historical review below shows that DGTA/DASA invested considerable time and effort over a three-year period (2015-2018) examining ways to optimise implementation of DASR-66 and -147 as a system to achieve the anticipated capability and safety benefits. This Part identifies some of the key improvements that DASR-66/147 has enabled in comparison to TAREGs which include:

   a. a direct link between training outcomes and certification privileges (missing under TAREG),

   b. a focused accountability for the certification of maintenance (improved from TAREG), and

   c. enabling a single trade to certify removal & installation of the majority of aircraft components (clarifying 'grey' and 'cross-trade' confusion under TAREG).

Nevertheless, achievement of benefits also requires some workforce and training redesign to fully exploit the potential increased flexibility and resilience of the maintenance workforce and a direct linkage of training effort to capability outcomes.

Previous attempts to optimise workforce structure

8.   Several major changes to workforce structure have been implemented since the 1990s. The first significant change to the aviation technical trade structure occurred during 1992-96 under the **Technical Trades Restructure (TTR)** project. The TTR flowed from the Technical Trade Structure Review Working Party which had concluded in July 1990 that the existing 'aircraft engineering' trades structure was seriously deficient and lacked the flexibility to address new technology levels being introduced with new aircraft acquisitions. Past trade structures also inhibited optimum productivity from the aircraft technical workforce at the time.

9.   Prior to TTR, Air Force had six large aviation trades: Airframe, Engines, Electrical, Radio, Instrument, and Armament. These trades were amalgamated into two trades: **Aircraft** (Engines and Airframe) and **Avionics** (Electrical, Instrument, Radio). In addition, aircraft metal workers, machinists and welders also became **Aircraft Structural** Fitters. Coupled with self-certification for selected CPLs and SGTs and platform-streaming that aimed to increase on-type experience to an average of 5 years, TTR was intended to deliver a 20% productivity increase. This was to be matched by a 20% reduction in establishment that was to be implemented via an initial 5% reduction in post-TTR establishment and further reductions over a five-year implementation period. Apart from the initial 5%, actual workforce reductions are unknown.

10.   TTR also introduced multiple skill levels of Mechanic, Fitter, Technician, Advanced Technician and Systems Technician, as well as the concept of Self Supervising Technicians (SSTs). The employment of SSTs was to parallel that of civil LAMEs in the airline environment with employment on the maintenance of complete aircraft and engine systems. These were some key outcomes. Considerable further detail along with references are provided in **Annex C** for optional reading to provide added context for later discussion on some workforce trade structure and training issues.

11.   A second significant change to workforce structure started in 2013 under the **Maintenance Productivity Improvement Project (MPIP)**. This project was focussed on reducing numbers in the aircraft maintenance workforce to provide offsets to accommodate new Air Force capabilities. Initiatives included less prescriptive maintenance policies relating to the use of Self Certifying Technicians (SCTs), Single Signature Tasks (SSTs) and Independent Maintenance Inspections (IMIs). However, beyond a strong focus on increased workforce productivity, there was no review of Air Force trade structures and maintenance training.

The 'Mandate' for change – specifically DASR-66/147

12.   The Air Force Board (AFB) on 27 Sep 13 considered a submission recommending migration over the next five years of the current suite of airworthiness regulations based on TAREGs, OAREGs and MILAVREGs to a more efficient and contemporary military airworthiness regulatory system. An action was placed on DGTA and DACPA to develop a detailed proposal for CAF consideration and approval by Dec 13. This led to development of a *'DGTA Position Paper[2]'* which examined benefits of moving to an ICAO-based regulatory convention as widely used in civil aviation. Options were examined which quickly focussed on EASA Regulations (termed EASRs) and, more specifically, a subset that were being adopted by a number of European military nations. This subset is termed 'European Military Aviation Requirements' (EMARs) and is limited to five key Technical Parts of EASRs. EASRs were

---

[2] 130808 -DGTA Position Paper -A Long Term View of Technical Airworthiness Regulation in Defence, BP35472907.

assessed as providing the most holistic, contemporary, internationally recognised and ICAO-compliant system that offered greater safety assurance and efficiency than other civilian regulatory systems such as FARs (USA) and CASRs (Australia). The Paper notes that '*EASRs were also being used by CASA as the basis of current updated maintenance regulations. ...As per the EASA framework, the militaries of EU members establish military systems aligned to overarching EMARs. At this time, EMARs will cover only design, production, maintenance, and continuing airworthiness management. EMARs represent the only emerging common convention in military aviation regulation.'* We wish to highlight that EMARs are still limited to only five technical Parts (21, M, 145, 147, 66), further details below.

13.   The DGTA paper noted the 'total system approach' of EASA regulations and explored the impact of possible 'partial', as distinct to 'full', adoption. Importantly, in the context of this Review, the paper noted that …'*EASA regulations Part 66 and 147 addressed maintenance personnel licensing and training organisation approvals which were not covered in any current DGTA regulations but were controlled by other mechanisms'*[3]. The **paper noted** that, although full implementation of all technical-related parts would yield the most benefits long-term, **Parts 66 and 147** also **represented the most complex and challenging option to implement**. Given these challenges, DGTA initially recommended **not** implementing EMAR-66/147 in the short-term (presented as option 1 in the DGTA paper). However subsequent discussion and senior executive input beyond DGTA led to the decision to proceed with full implementation of all technical-related EMARs, including Parts 66 and 147 (ie, option 4). The '*Decision Brief for Defence Aviation Authority*[4]' records this approval (29 Nov 13). The Brief also records agreement and direction to comply with the '10 Guiding Principles for Better Regulation' in developing the new regulations.

14.   During the period 2015-17, DGTA staff undertook considerable due diligence examining effort and risks associated with planned implementation of all parts including EMAR-66/147. A '*Status Brief on New Defence Aviation Safety Regulation*[5]' (dated May 15) presents further significant detail on the exact extent to which EASR's and the military equivalent EMARs would be implemented in the new DASR suite. This paper examined the EASR suite of regulations under five streams – as shown in figure 1 below.

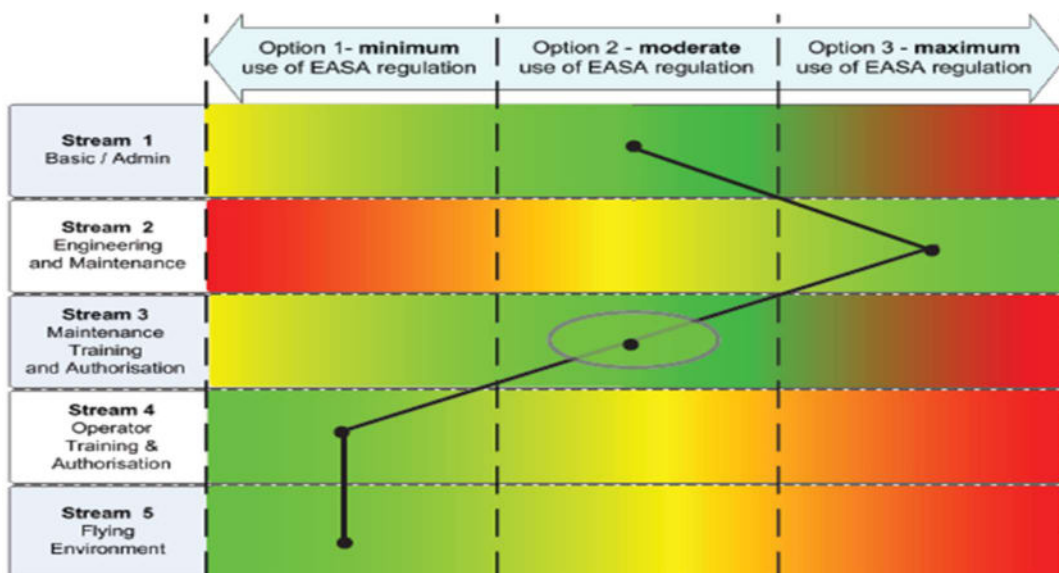Figure 1 – Proposed DASR Regulation Streams circa 2015

---

[3] Ibid para 44.
[4] 131127 -Decision Brief DefAA -Concept to Redesign Airworthiness Regulations, BP35472932.
[5] 150521 -Status Brief -New Defence Aviation Safety Regulation (May15), BP35472936.

15.   To maximise advantages to Defence, the paper notes that the new DASR suite should aim to be '**as EASA (civil) as possible, as military as necessary'.** It also notes that '*...there is no expectation that EASA regulations will be incorporated uniformly across all streams acknowledging that full adoption of EASA regulation is not appropriate for Defence operations.*' The paper explores three options for the level of implementation across five streams as shown in Figure 1, these being 'minimum', 'moderate' and 'maximum' – with the latter two being referred to later as to '**adapt**' and '**adopt**' respectively. As noted above, only Streams 2 and 3 focus on technical aspects of EASAs regulations which have been reflected in EMARs.

16.   Stream 2 'Engineering and Maintenance' in Figure 1 specifically relate to:

   a. Initial and Continued certification of the aircraft Type design (DASR-21),

   b. Managing Continuing Airworthiness during an aircraft's operating life (DASR-M), and

   c. Defining requirements for aircraft Maintenance Organisations (**DASR-145**).

Figure 1 shows the intent was to fully '**adopt**' ('maximum' use of EASA regulation) in the rollout that commenced on 30 Sep 16. We observe that full adoption of these three parts has generally been well accepted, supported and welcomed across the entire regulated community, particularly by Defence Industry. Training and promotion of the migration was generally well resourced and later regarded as effective during rollout of DASR-21, DASR-M and DASR-145 in late 2016. Hence, **we observe** very little debate over the added value and benefits with full **adoption** and alignment to an international civil code with implementation of these three DASR Parts. Nevertheless, we received some negative feedback over a lack of clarity in language and concepts used in DASR-145 and the interface with, and dependency on DASR-66 licenses which is addressed in Part 2 of this report.

17.   Stream 3 'Maintenance, Training and Authorisation' in Figure 1 specifically relate to:

   a. 'Maintenance Licensing' (**DASR-66**) in June 2017, and

   b. 'Aircraft Maintenance Training Organisations' (**DASR-147**) in October 2017.

Importantly we note that these two technical DASR Parts were introduced a short time after the initial DASR roll-out on 30 Sep 16. Figure 1 also shows that the intent was to '**adapt**' ('moderate' use of EASA regulation) these two Parts.

18.   As part of the detailed due diligence activity from late 2014, a number of research papers were produced examining the issues and risks for both ADF units and Defence Industry associated with fully **adopting** EMAR-66/147. A number of extracts from these papers are particularly relevant to topics included in our TORs for exploration and later comment. The first extract comes from a paper *Licencing of Air Force Technicians*[6], (dated Jan 15) with the following summary:

> *At a macro level, Air Force appears to have an equivalent 'system' to that required by EMARs 66 and 147. **However, at the micro level Air Force will likely encounter difficulties in explaining equivalence to external agencies** because Air Force's technical workforce is subject to four internal (Defence) and two external 'systems' – internally: the PDS – which involves DGPERS' and DGLOG's systems; the Defence Training Model (DTM) and the FEGs; externally: the Australian Skill Quality Authority (ASQA) and the Industry Skills Council (ISC). **The interaction between these systems is complex and not well-understood within Air Force, let alone by external agencies**. Nevertheless, the interactions result in the trades' qualification, training and experience outcomes but the NMAA has little, if any, ability to influence three of the six 'systems' (the DTM,*

---

[6] 150127 -Paper -Licencing of Air Force Technicians, BP35472966.

ASQA and the ISC). (DGTA - if appointed to manage EMARs 145, 66 and 147 on the DefAA's behalf – has even less ability to influence those 'systems')[7]. [**RT emphasis**]

19.   This paper goes on to examine a variety of maintainer backgrounds that would need to be assessed:

[That] if EMAR 66 is adopted - but without implementing unencumbered licences…[and] EMAR 145 is completely adopted then… issuing the initial set of licences would create a very large workload because of the number of personnel to be licenced, and the fact that licence exclusions will be based on each individual's training and work history, which must be documented and reviewed in detail to determine the appropriate exclusions.[8]   [**RT comment:** – proven true.]

20.   The paper continues with an examination of the gaps that exist between the Australian Skills Quality Authority (ASQA)[9] standards and EMAR-147, summarised as follows[10]:

RAAFSTT and DATA (the School's training contractor) are both RTOs. Therefore initial employment and advanced technical training delivered at RAAFSTT meet most of the requirements of EMAR 147. ***The principal differences between the ASQA Standard and EMAR 147 are that:***

- *the ASQA Standard is more prescriptive than EMAR 147 regarding qualifications for trainers and assessors,*
- *the ASQA Standard does not require an exposition, however regulations 6 and 7 of the Standard contain some of the elements of an exposition,*
- *the ASQA Standard has no defined requirement for staff continuation training whereas EMAR 147 does, and*
- *while the ASQA Standard requires regular audits,* ***the EMAR 147 audit requirements more prescriptive.***

Adoption of EMAR 147 would create a large initial workload for RAAFSTT, primarily in developing their exposition. There will also be a continuing workload to maintain the exposition and to prepare for and responding to audits. However, the continuing workload is unlikely to be significantly larger than the ASQA compliance workload. [**RT comment:** – proven true.]

FTFs [Field Training Flights] are not RTOs, but competency assessments undertaken at squadrons fall within the RTO framework. *Consequently, if the ASQA RTO Standard was to be used as the basis for EMAR 147 compliance then both FTFs and squadrons will need Expositions and compliance audits.* ***Squadron competency assessments are already subject to ASQA audits,*** [**RT comment** – this statement is incorrect, see details below] *…consequently the effect of adopting EMAR 147 will primarily be a one-off increase in workload to create an exposition, together with a small, continuing workload in maintaining that document. However, the authority's auditing workload will have to increase to encompass FTFs and competency assessments at the squadrons. A formal agreement should also be struck between the authority and ASQA to recognise the similarity between of EMAR 147 and the ASQA Standard and agree that an EMAR 147 compliance audit will satisfy ASQA's requirements, therefore eliminating the need for RAAFSTT, FTFs and squadrons to be audited twice.* [**RT emphasis** above]

Although we have flagged an error in the extract above (ie, FTF's are **not** subject to ASQA audit), we consider the remainder of the extract deserves comment. Specifically, that DASA should not audit / oversight a Maintenance Training Organisation (MTO) that is subject to audit /

---

[7] Ibid, para 15, BP35472966.
[8] Ibid paras 76-77, BP35472966.
[9] ASQA is the National regulator of post-secondary school education and training and issues the Standard regulating training delivered by TAFEs. This Standard requires TAFEs to be Registered Training Organisations (RTOs) with a documented Quality system.
[10] Ibid paras 83-85, BP35472966.

oversight by ASQA. However, DASA should audit / oversee an MTO where training courses and delivery are outside the scope of the RTO or where the credibility of RTO is considered questionable. This is particularly important for Air Force with its distributed training methodology and less important for Army and Navy with their centralised training methodology.

Finally, although this is a lengthy paper (93 pp), the Executive Summary (4pp) provides a useful summary of key issues that need to be addressed – these are discussed further in Part 3.

21. A second paper *Aviation Maintenance Workforce Analysis*[11] (dated Jun 15) follows-up comparing areas of the civilian aviation workforce, differentiating between Air Force's aviation technical workforce and ADF Contractors who comply with DEF(AUST) 9022 versus those supporting civil aircraft in a CASR-145 MO and hold licences compliant with CASR-66. This work demonstrates the different maintenance effect that can be achieved from different trade/licencing constructs, concluding at the time that:

> *Air Force and [DEF(AUST) 9022] contractors. Air Force and contractor workforces are broadly comparable in capability* if the DM element of the contractor workforces is included in the assessment, *except for the Armament trade which is unique to Air Force*. However, if the DM element is excluded, then Air Force's workforce is more capable than our contractors, being able to deliver a broader range of functions and processes. The contractors' workforces should be more efficient than Air Force's, as the former can tailor (minimise) the workforce's skill sets to only those required in their workplace, whereas Air Force needs a broader skill set so that individuals can be employed in any technical position.

The report provides further detail on a comparison between Air Force and CASR-145 MOs, and also between Defence Contractors (per DEF(AUST) 9022) and CASR-145, but is not relevant to this report.

22. Similar to the earlier paper '*Licencing of Air Force Technicians*', another research paper, '*Licencing of Navy and Army Technicians*'[12] (dated Aug 15) looked at EMAR-66 licences for Navy and Army maintainers given their different rank and trade progression streams and concluded:

> To be eligible for unencumbered licences, *Navy and Army would need to rework their trades, training*, pay and promotion and some maintenance documents. Such changes will create very high workloads and significant costs and is not recommended. Nevertheless, the decision on whether or not to adopt that course of action rests with those Services. … *To produce Navy and Army technicians who could hold full B1.3 licences (ie without exclusions), both Services would have to review, at minimum: workforce structure*, pay and progression, initial trade training, and some maintenance publications and documentation. In addition to those reviews, a transition plan would be required to migrate the current workforces to an EMAR- 66 based system. **[RT emphasis /comment**: Army have achieved full B1.3 licences, and Navy are examining the removal of the one remaining Electrical Exclusion.]

23. Summarising issues in the significant due diligence activity conducted during this period, the Noting Brief for DGTA *Personnel Licensing IAW EMAR66*[13] (dated Jul 15) presented 16 key issues that would influence the DASR implementation schedule. Of the original 16 issues, four remain relevant and are listed below:

- *Re-alignment of trades – High priority (importance/ impact). …the knowledge and skill sets to hold licences without exclusions are very different to the knowledge and skill sets held by the current ADF trades*. Changing the trades to align with licence requirements is possible, but very

---

[11] 150611 -Paper -Civil workforce analysis, BP35472928.
[12] 150804 -Paper -Licencing of Navy and Army technicians, BP35472938.
[13] 150727 -DG Brief -Personnel Licencing IAW EMAR-66, BP35472971.

difficult. Nevertheless, each Service (and contractor AMOs) should decide on whether or not to make such a change.

- ***Agreeing which organisation(s) will have responsibility for approving trades' standards – High priority (impact/lead time).*** *At present, trades' standards are set by each Service's trade sponsor (E). They have the authority to vary these standards without reference to the TAR (DGTA). Under current organisational arrangements the sponsors will have no obligation to align trades' standards with licence standards. If these standards are poorly aligned there is a risk that AMO capability/capacity will be affected because of the number of licence exclusions which will be necessary.*

- ***Setting the minimum rank and skill grade criteria for licence holders - High priority (importance).*** *References A and B show that senior LACs (E) are eligible to sign 'certificates of release to service' for aircraft and aeronautical product. Such certifications are currently made by SNCOs (and, in some limited circumstances, by CPLs (E). The NMAA (or delegate) needs to decide whether it is appropriate for junior technicians to make such certifications or whether a more conservative approach should be implemented.*

- ***Resourcing the licencing organisation(s) and training the staff*** *- **Medium priority (lead time).** If tailored licences are to be issued, each individual's initial trade training, subsequent courses and workplace experience will need to be assessed. …could be eligible for more than 11,000 licences. …Preliminary analysis indicates that approximately 12 staff would be needed to issue the tailored licences to ADF technicians if they are to be issued within two years …The number of staff needed thereafter has yet to be assessed, but it likely to be approximately 2 - 4.*

24.   Following DASR rollout on 30 Sep 16, a further Brief to DG DASA on *DASR-66 Implementation Strategy* (dated 18 Dec 16) identified five continuing noteworthy risks. We note that the first and last of these risks listed below are still current and being realised but could be retired with adequate resourcing. The middle three are not retired and are currently considered secondary issues but, if not addressed longer-term, could continue to threaten optimisation of Australia's collective aviation-sector effectiveness. The original noteworthy risks are listed below, along with **RT comments** on current status.

a.   *the successful development of the automatic licence generation tool - risk level unknown at present,* - **RT comment:** Risk remains as the current FastTrack tool has not yet stabilised, hence Defence does not yet have a proven mature tool with required functionality to allow possible additional access, audit, security protocols, etc across the Air Domain. Incidentally, we note that full 'automation' is unlikely due to errors and nuances which will always require some human interpretation.

b.   *civil licencing of contractor staff - a number of factors cause this to be a High risk option,* - **RT comment**: There are currently three impediments – CASA's authority to issue licences for military aircraft, willingness of CASR Pt147 to accept Defence's competency-to-licence syllabus mapping, and the willingness of CASA to accept that Air Force training meets licencing syllabi. These three impediments remain extant with no indication of resolution, although resolution should be considered low priority as it will not directly enhance ADF capability.

c.   *civil licencing of future Air Force technicians if employed by contractors- High risk if Aeroskills Cert-IV qualification is not achieved,* - **RT comment:** In 2016, the Air Force trade sponsor was planning to remove the requirement for technicians to achieve a Cert-IV qualification. This did not eventuate, but the issue remains because CASA requires a Diploma qualification. Like para 24b, resolution should be considered low priority in contrast to matters directly impacting ADF capability.

d.   *mutual recognition of DASA- and CASA-issued licences,* - **RT comment**: In 2016, AFHQ had shifted away from the use of national competencies and the MPIP removed

competency assessors from unit workforces – this remains a choke point within Units seeking to remove licence exclusions for their maintainers. The CASA-DASA mutual recognition issue remains extant but will not be achieved in the medium term.

e. *establishing a fully functional licencing Authority/Authorities - High risk if development of the automatic licence generation tool proves infeasible* - **RT comment:** DASA has been unable to meet the demand for licence issuance and updates and is working to reduce backlogs. Further system productivity is required from a combination of an improved tool, increased staff, and a potential devolution of some work to a DoSA (further discussed below). This issue remains in work but has yet to become sustainable 'business as usual'.

25. The Status Brief provides some further discussion on how DASR-66/147 should be **adapted** and tailored for Defence use[14]. Importantly, it notes that **adapting** EASA licensing '…*will provide a standardised benchmark for comparing aviation technical training across the Services and commercial industry. Adapting some components of EMAR Part 66 and Part 147 for our use will:*

a. *Enable ADF training standards to be traceable to a recognised international standard. **This will allow Defence to exploit blended workforce solutions with civil and military technicians working within the one organisation, and for Defence to recruit experienced technicians/supervisors laterally from civilian industry (or visa versa).** This will concurrently support implementation of Project Suakin workforce reforms, including the use of dual* employment within Defence and civilian industry.

b. ***Simplify recognition of foreign military and local/international civilian aircraft maintenance staff competence.** This will enable Defence to exploit global civilian spares pools and clear the way for mutual maintenance arrangements with coalition partners.* [**RT emphasis**]

26. The Brief to DG DASA titled *DASR-66 Implementation Strategy[15]* provides further detail on choices made by Defence in **adapting** EMAR-66 for ADF use. This extra detail on the level of adaptation is reflected in Figure 1 shown on page 4 (for Stream-3). This figure appeared in a number of PowerPoint information briefing slides at the time, this one extracted from a DASA presentation to the Air Command Board on 4 Apr 17 with the following 'speaker notes':

"***DASR 66 and 147 sit in the sweet-spot of 'moderate use' of EASA Regulation/EMAR; ADF will retain pragmatic business practices that***:

*   ***enable the rapid generation of capability such as in-Squadron training*** *to enable rapid acquisition and field new fleets.*

*   ***retain the primacy of extant ADF business systems*** *for Technician's Record of Training and Experience (RTE) and **maintenance authorisations**; Military Aircraft Maintenance Licences will reflect and lag RTE & authorisations.*

*   ***Retain the current trades*** *(new talking point added 30 Mar 17)."* [**RT emphasis**]

We observe and consider comments above in paras 25-26 to be important and noble objectives and provide a useful reference point and benchmark against which to assess feedback from the regulated community to current DASR-66/147 implementation.

27. **Training and promotion of DASR-66/147**. Turning to training and promotion material, we found it interesting to examine some briefing material used by DGTA staff during the 2015 'Roadshow' presentations. Much of the material presents a rather 'minimalist' approach as evidenced in the extract below (taken from PPT package titled '*Future DASR – Module 6 –*

---

[14] Ibid paras 31-32, BP35472971.
[15] 161218 -DG Brief -DASR-66 Implementation Strategy dated 18Dec16, BP35472981.

EMAR Pt 66 – Military Aircraft Maintenance Licensing[16]'). The message from much of this material was that '*If you have been authorised to do this work in the past, you will be authorised to do this work in the future*'. This had not considered the subsequent more detailed 'bottom-up' approach of a detailed examination of education profiles per CASA and RTO business practices.

- *Individual apply for licence; the Authority reviews the individual's Q, T, E and issues licence, with/without exclusions ie the licence defines the scope and level of maintenance that individual may perform. The 145 organisation then applies their context against that licence and their own assessment of the individual's competence and authorises the individual to certify particular maintenance activities. In Defence's context, the 145 authorisations are essentially the same as the current Task Authorisations issued by the SMM (except that under EMARs, the QM issues authorisations, not the SMM)*

- *So, if an individual hasn't completed the all the required training for a licence, then that individual may be issued with a licence with exclusions. Eg an individual who has a Cert-IV in Aeroskills (Mechanical) has received minimal training in electrics and avionics. That individual could be eligible for a B1.1 licence with exclusions for electrics and avionics components/systems.*

- *The 145 may decide that an individual lacks sufficient experience within particular components/systems. That individual will not be authorised to certify for maintenance performed on those components/systems. Once the individual has gained the necessary experience, his/her authorisation will be amended to include the performance and certification on those components/systems. (Directly analogous to 7001.059 task authorisation process.)*

28.   Lastly, we note that the current state of EMAR adoption and adaption by France, Italy, Germany, Spain and the United Kingdom has been described in a recent Royal Aeronautical Society (RAeS) Journal paper[17]. The paper lists a number of friction points that exist for the five main nations on their separate paths towards harmonising and standardising military airworthiness in Europe. It notes that while all five countries have adopted EMARs, it is through a '*variety of regulatory constructs which exhibit diverse practices*'. It is clear that EMAR is a system that continues to evolve and requires effort to make it work for sovereign nations responsible for '*regulating military airworthiness in the way they consider best for the interests of their state.*'

PART 2 – DASR-66/147 IMPLEMENTATION BY DASA

29.   Having examined the original Mandate for change and planned scope of DASR-66/147 implementation, we now look at DASA's approach to implementation, tested in some areas against considerable feedback that we received from the regulated community. Although the Review TORs (para 12a) provide some specific focus areas, we see value in initially examining feedback under a number of major themes. Broadly considered, we have grouped considerable feedback under the following five major themes, along with some other matters, and address each individually below:

a.   Lack of clarity and inconsistency in the use of language in DASR (145, 66, 147),

b.   Lack of clarity in DASR-145 and a narrative to differentiate between 'supervising' and 'certifying' maintenance activity,

---

[16] 1507xx -PPT -Training Module6 -MAML … BP36847492.
[17] Pittini M, and Kourousis KI, Harmonising and standardising military airworthiness in Europe: a review of key aspects and achievements | The Aeronautical Journal | Cambridge Core, 2023.

c. Lack of a broader narrative to relate key new terms introduced by DASR-145/66 to previous well understood maintenance terminology and concepts under TAREGs,

d. Major complexity, delays and inefficiencies with the assessment, and initial issue and update of DASR-66 Licenses (ie MAMLs), and

e. Management of Deferred Defects.

Lack of clarity / consistency in use of DASR language

30. In maintaining alignment with EMAR-145, DASR-145 has introduced several new terms that are central to the conduct and management of aircraft maintenance, these being **'Certificate of Release to Service' (CRS)**, **'Certifying Staff'** and **'Support Staff'**. In doing so, it has led to removal of the specific words 'certify' and 'certification' from practically all previously used language associated with the conduct of maintenance – terminology and actions with which aviation technicians, supervisors and engineering staff had been very familiar.

31. We note that the word **'certify'** is rarely used - only once in DASR-145.A.30, similar in DASR-66, and both times unrelated to maintenance activity (instead only to MAML holders). We also note that the word **'certification'** is only used (albeit liberally in both DASR-145.A.30 /35 and DASR-66) as an adjective when using the terms 'certification authorisation' or 'certification privileges' and then only when specifically referring to 'Certifying Staff' who must be MAML holders. On the contrary, these two words were used extensively in previous TAREG maintenance terminology to describe technician/supervisor maintenance and 'sign-up' activity. Hence, adoption of DASR has led to these two important words effectively being 'hijacked' or re-purposed for use in one specific activity and excluded from the regular lexicon of technicians /supervisors and concepts with which they were extremely familiar. Instead, DASR has adopted the term **'sign off'** which, itself, is only defined in a rather obscure location [ie, AMC to DASR-145.A.65 (b) (3), Para 4, 'Note'] and rarely used thereafter. Also, sign off not defined in DASR Glossary.

32. We also note that the **concept of supervision has practically disappeared** from DASR-145 and -66 with the words **'supervisor'** and **'supervision'** rarely used. These words were part of foundational concepts and widely used in both technical policy and maintenance procedures to describe much of the maintenance and 'sign-up' activity conducted by Tradepersons, Trade Supervisors and Maintenance Managers when progressively certifying maintenance performed under TAREGs. We note that the terms 'supervise'/ 'supervision' are only referenced, once again, in a rather obscure location [ie, AMC2 to DASR-145.A.30 (e) (3), Para 5, points 3-6]. We consider that the lack of a broad clear narrative has contributed to misunderstandings on the nexus between 'certification' and 'supervision'. This is further addressed under the next major theme below (see paras 41-45).

33. Looking at the first new term introduced by DASR above, ie '**Certificate of Release to Service' (CRS)**, we see that it is defined as *'a statement, signed by an appropriately authorised person, … which asserts that maintenance has been properly carried out'*. However, these last few words '…*Release to Service'* do not signify the common English, and previous TAREG understanding associated with 'certification' of any maintenance task. Instead, the words imply an action previously well-known as a 'Maintenance Release' (MR) under TAREGs. Rather, this MR is now achieved as a 'Maintenance Organisation Release' (MOR) which is an entirely separate action conducted by the CAMO (under DASR-M), not within the MO under DASR-145. This separate and strong focus on CRS still creates some confusion.

34. Looking at the second new term introduced by DASR above, ie '**Certifying staff'**, we see that it refers exclusively to authorised persons who hold a MAML - either a Cat-A, Cat-B1/B2 (for Line Maintenance) or Cat-C (for Base Maintenance). Only a MAML holder can issue an

aircraft CRS. **We observe** a **conflation of CRS with the past Trade Supervisor role** resulting in a strong focus on having a large number of MAML holders to perform the duties of 'Certifying Staff' (addressed further below at para 45). This has led to a reduced focus on the previous 'Tradesperson' role in performing maintenance, with no specific coverage of action taken by a non-MAML holder to signify the completion of any maintenance task performed under the DASR-145/66 construct - when, in fact, the previous 'Tradesperson' role still exists within the Task Sign-Off (TSO) process under DASR, is as prominent as ever, and does not require a B-MAML holder to execute. This is part of a missing narrative, although this TSO activity is covered well in AFCAMAN and is discussed further below (paras 46-49). The third new term '**Support Staff**' refers to authorised B-MAML holders when operating in a 'Base' maintenance environment. This term also introduces some further varying interpretations as covered below.

35.   Further complexity in use of key language occurs with differentiation in DASR-145 between '**Line Maintenance**' and '**Base Maintenance**' - both can be conducted concurrently to different aircraft in regular ADF Operational Maintenance units. A CRS is to be issued at the completion of individual or a group of maintenance tasks in 'Line' by either a Cat-A or Cat-B1/B2 MAML holder (per details above) whereas in 'Base' a CRS is only to be issued by a Cat-C MAML holder at completion of maintenance. To achieve this in 'Base', the Cat-C MAML holder relies heavily on 'Support Staff' - who have the same qualification criteria and the same level of involvement as they would as 'Certifying staff', but who themselves never issue a CRS in 'certifying' work performed, either personally or supervised, but performed by others.

36.   We note considerable past confusion and debate on how this 'certification' activity in 'Base' maintenance should be described simply. We note attempts to initially address this in an Advisory Circular - *AC 05/2018 'Certificate of Release to Service responsibilities for MOs and CAMOs',* since withdrawn and replaced by *AC 05/2020* (similar title). We applaud the clarity that *AC 05/2020* attempts to provide by clearly stating that completion of maintenance under DASR requires two actions: a Task Sign Off (TSO) and a CRS. However, this does not fully address 'Base' maintenance where a traditional maintenance certification by a B-MAML holder, which may include supervision, clearly signifies more value-add than just a TSO. We tested DASA staff on how this action should be more clearly defined - with possible use of the word **'verify'** as used in EASR/EMAR - but this was still considered somewhat inappropriate and clumsy. We also tested Units and Industry staff on how this action by a Cat-B1/B2 MAML holder is recorded, with varying responses albeit the best answer being a rather lengthy phrase now used in maintenance documentation of *"Acting and Signing as Support Staff".*

37.   We also note regular references in DASR-145 (particularly 145.A.35 and 145.A.50) which address 'Certifying/Support Staff' and 'Certification of Maintenance' respectively) to also include **components** as requiring a CRS, ie a similar requirement to **on-aircraft** maintenance CRS. However, both GM to DASR-66.A.15(1) and AFCAMAN[18] make it clear that there is **no** requirement for a CRS for any **component** maintenance, hence no requirement for certification by a MAML holder in a **component** maintenance environment.

38.   In summary, by adopting EASR/EMARs, Defence aviation has implemented what we consider to be a degree of 'mangled language' - which has not yet been fully translated into a broader narrative to support a clear understanding and application of DASR concepts, principles and maintenance processes. Hence, **we recommend** further work by DASA to provide added clarity in DASA products including Fact Sheets, relevant publications including the AFCAMAN (further addressed in paras 46-49), DASR training and promotion material, and possibly in DASR AMC or GM. **We also recommend** AFHQ LOGBR (with HQAC AFCAMAN support) develop updated CAMM2 (and other maintenance management systems), business rules and functionality

---

[18] Instead, AFCAMAN B4, C3, paras 1.36-40 provide details of requirement for an 'Authorised Release Certificate' (ARC) to replace a CRS, BP35476149.

to align with contemporary DASR practices and requirements (further addressed in para 178 and 179)

39.   Looking collectively at the issues above, we believe the strong focus on the need for CRS signatories has also led to an excessive organisational dependence on technicians rapidly achieving a MAML. We received feedback from junior technicians feeling pressure to achieve an early MAML, including feedback that, if not achieved, there could be negative consideration of suitability for promotion. This raises some concerns but is outside our TORs to address. We also received feedback from more senior supervisors that perceived …*'once a LAC/W gets a MAML, no further growth path, no differentiation between a 2 yr vs 10 yr experience technician (LAC/CPL)'*.

40.   Rather than overly focus on the CRS 'Certification Privilege' provided to a Cat-B MAML holder, we consider it useful to examine the real intent/achievement of being a Cat-B MAML holder. We see this as two-fold. Firstly[19], it defines a level of competence (including experience) bench-marked against a Part 66 International framework that provides the basis for award of either a full License, or a part License with Exclusions. This level of competence is underpinned by training and experience that is directly related, and traceable to the competencies necessary to certify aircraft maintenance within the scope of the MAML held. Secondly, when authorised as Certifying staff or Support staff, the MAML holder provides '*an additional safety barrier and has the function of coordinating the different tasks, supporting Maintainers in case of mistakes or unexpected difficulties and* **verifying** *that the job has been properly completed and task signed-off*[20] (TSO'ed). This additional safety barrier is provided by the supervising management and oversight role that only Cat-B MAML holders perform as a result of their direct and traceable competence to do so within the scope of the MAML held. A key objective of DASR-66 licensing is benchmarking against an international standard whereby personnel competence and maintenance practices can be leveraged for mutual recognition. We note that some foreign militaries have not yet mandated this requirement but have adopted the same objective but with different terminology. Further discussion later, specifically on UK terminology in Part 3 of this report.

Lack of a narrative to explain 'supervision' and 'certification'

41.   Feedback from focus group sessions revealed some considerable frustration and misunderstanding over the absence of any clear or strong reference to the **'Trade Supervisor'** role in new DASR terminology. The 'Trade Supervisor' title, role, function, and 'sign-off' has been part of foundational concepts under TAREGs and all preceding historical ADF maintenance systems. Instead, as noted above (para 32), the terms 'supervision /supervisor' rarely appear in DASR, including GM and AMC. In its place, DASR has introduced the CRS which, as noted above, can only be provided by a MAML holder and '*...asserts that maintenance has been properly carried out.'* This has led to a conflation of CRS with the past Trade Supervisor role and resulted in a strong focus by all FEGs on developing a large number of MAML holders to perform the duties of 'Certifying Staff'. This has also led to particular frustration in **Specialist trades** - including ASTTECHs who DASA do not consider have sufficient Basic Knowledge to justify issuing a MAML. (Further discussion on ASTTECH issues later in Part 3, paras 118-124).

42.   In seeking to clarify the nexus between **'certification'** and **'supervision'**, we find the only noteworthy detail as being provided in an EASA policy interpretation document[21].

---

[19] DASR 66, BP35477368.

[20] 151217 -EASA policy on Certificates of Release to Service (Dec15), Section 8, BP35472897. AMC1 145.A.30e para 5 concerning 'supervisors', and AMC 145.A.65(b)(3) para 3 and its associated 'Note' relating to 'supervising', are insufficient to 'explaining' the topic.

[21] 151217 -EASA policy on Certificates of Release to Service (Dec15) - Obj BP35472897.

Although not directly addressing these two terms explicitly, we consider EASA's interpretation of the DASR-145.A.50(a) requirement when issuing a CRS as providing the basis for important and much-needed clarification on the nexus between these two terms. Hence we have included EASA's exact Section 6 wording below, along with three inserted *[words]* to assist understanding and discussion below:

> **6. What does it mean *"when it has been verified that all maintenance ordered has been properly carried out"***
>
> This [*verification*] doesn't necessarily mean that certifying staff have to perform or supervise the whole process of every task, but the need to assess the complexity of each task, making sure that they [*tasks*] have been assigned to personnel authorised to sign-off to the corresponding level, coordinating the different tasks, supporting that personnel in case of any mistakes or unexpected difficulties and **verifying** that the job [*tasks*] has been completed and signed-off properly.
>
> As a consequence, this is not just an administrative task which can be performed from a remote location or without having been involved at all. Certifying staff have the last call on the amount of involvement they would like to perform in order to be satisfied that the maintenance can be properly released, and this level of involvement cannot be predefined or limited by the organisation's procedures.

43.   The first sub-para above is important in that it describes the role of 'Certifying staff' as similar to the role of the 'Maintenance Manager' under TAREGs which includes assessing task complexity, assigning authorised personnel to sign-off at the appropriate level, defining the 'amount of involvement' (which includes supervision) in task conduct, co-ordinating activity with other trades/staff, supporting staff when difficulties arise, and finally verifying all work completed. We also wish to differentiate between:

    a.   Supervision of the 'technical task' - provided by the experienced Tradesperson over those who are 'Under training', and

    b.   Supervision of 'all maintenance ordered' - by the MAML holders' of the numerous tasks that they are managing as listed in the sub-para above, or in the absence of personnel with relevant MAML privileges, supervision by the iMMA[22] ASTTECH of the Tradesperson completing all the trade tasks required to complete an on-aircraft structural repair.

We also highlight the relationship between the two terms:

    c.   **'Certification'** by 'Certifying staff' (MAML or iMMA holder) is premised on their having 'verified that that all maintenance ordered has been properly carried out'.

    d.   **'Verification'** in turn, required supervision of *'all maintenance ordered'* and can include supervision of the 'technical task' – up to 100% supervision if the MAML holder choose.

Importantly, 'Certification' and 'Supervision' are not mutually exclusive or stove-piped activities, there are overlaps, and the degree of overlap is driven by the situation at hand and the requirement of the Certifying staff.

44.   Lastly, we note the table provided in GM2 to DASR-145.A.30(e) –'*Competence assessment procedure'* that lists the skill sets expected across the workforce to effect 'certification' and 'supervision'. This table shows attributes for 'Supervisors', 'Certifying and support staff', 'Mechanics' and 'Specialised Service staff'. Importantly, we note:

    a. the strong correlation in attributes expected of 'Supervisor' and 'Certifying and support staff', and

---

[22] iMMA – 'Interim Military Maintenance Authority', further details at DASA Advisory Circular 001/2021 Certification of On-Aircraft Structural Repairs Interim Arrangements, and paras 118-122.

b. the distinct gap between these two job functions and other grouping of 'Mechanics' and 'Specialised Service staff'.

45. We consider that clarification of the relationship between 'certification' and 'supervision' requires priority action. Navy's recent re-write of their 'Conduct of Maintenance' SI suite (refer para 138) may have use beyond their local use.   Hence **we recommend** that DASA give priority to developing an education package supported by DASA products including a Factsheet to provide clarity to the nexus between 'certification' and 'supervision'.

Lack of a narrative to relate new DASR terminology to previous TAREGs

46. Further to the discussion above, we note the lack of a broader narrative to relate new DASR-145/66/147 terminology to previous TAREG concepts and terminology. Our initial desire was to see a table which clearly showed TAREG concepts and terminology cross-referenced to DASR. However, after several attempts, this failed with feedback suggesting that it was better to simply accept DASR as a new framework with its own language and terminology.

47. **We observe** the significant effort invested by HQAC-A9 to develop a wider narrative in the AFCAMAN. We received an excellent submission from a member of the HQAC-A9 team at the time[23] describing their vision and some activity /outcomes. We see value in providing some extracts below which provides context for further discussion.

> *In writing AFCAMAN …, A9 strove to provide the Voice of the Business, while considering the Voice of the Customer. Goals were to set a minimum level of Enterprise standard.*
>
> *…Also engender a common lexicon. As a compulsory policy document, the* [previous AAP7001].*059 ensured commonality in the roles and responsibilities of Tradesperson, Trade Supervisor, Self Certifying Technician et al. However, as Pt66 was rolled out prior to AFCAMAN finalisation, the three Services and all FEGs came up with their own vernacular. A9 was working to reel that in for a variety of reasons (common training, posting between FEGs, promotion boards, EPs, etc).*
>
> *…Provide a 'sandpit' in the way it was written – ie. standardise where it made sense, allow flexibility where possible. Less prescriptive than the .059 to accommodate the outcome focused DASR vice the process-based TAREG.*
>
> *…Be collaborative in our approach. Chapters were produced with input from all FEGs, 16BDE, and FAA. DLCs, SENGOs, and WOEs were regularly engaged, and A9 ran many combined workshops. All chapters were passed to DASA for comment prior to publish. Difficulty was encountered when trying to get key players to think beyond their tenure – ie. wanted the short term win without any bent on fixing long term or enduring issues.*
>
> *… Educate and unite! A9 AFCAMAN/66 Roadshow – A 'Techo for Techos' information package was developed by A9 and rolled out across nigh on 75% of the entire aviation technical workforce of Air Force, Army, and Navy. The same presenters from A9 delivered the package to ensure a commonality of message, and also to gather and collate workforce feedback. The presentation was also delivered to the 145/66 folk in DASA.*
>
> *While not throwing spears at* **the DASA Pt66 training, it was very regulation focused, and did nothing to inform the workforce on the 'how' – to be fair, that wasn't DASA's bailiwick – however, it generally left the workforce more confused**. *The A9 roadshow and the AFCAMAN were the 'how'. A similar package was developed and delivered to nearly all B licence holders, MM, SENGO, and WOE on the introduction of Deferred Defects and Command Clearance.*
>
> *…A9 identified that the introduction of Pt66 should have sparked an in depth review on SQN composition, and the ratio of licence holders to maintainers. This would have had to* **include a**

---

[23] 230703 -82WG +Unfiltered comments -Jorgo+Knight+Fallows dated 13Jun23, BP35472930.

long hard think on how business was to be conducted moving forward. I'm not convinced the organisation is there yet, and some of the moaning I still hear is because of self-imposed constraints, and not regulatory requirements.

…A9 was also working on a training/experience progression model to support licencing and allied promotion progression. As this was conceptual and required a change to training and Unit construct, many saw this as way beyond their current tenure and were reluctant to devote any real thought to the idea. **[RT emphasis]**

48.   Comments recorded above reflect and closely align with feedback from all focus group sessions. Importantly, we noted frustration in a number of areas over the **lack of a wider narrative** which **has led to some misunderstandings being codified into MO practices**. It has also led to updated guidance material that AFCAMAN attempted to provide which extends beyond DASR regulation material to explain how DASR-145/66/147 can be efficiently and effectively integrated into ADF FEG/Unit maintenance management systems. In our examination of different FEG/Unit SIs, we noted some great local initiatives on issues that have caused considerable frustration and debate in other FEGs/Units that could be adopted, or further developed, as 'best practice' at a corporate level. Hence **we observe** considerable value in effort being applied to develop a further living document which captures this material including potential 'best practice initiatives'. This also needs to be included in much-needed updated IET training for future technicians (more discussion later).

49.   However, we note recent DASA advice[24] that the AFCAMAN is no longer mandated but for guidance only. We also note DASA discussion and agreement with HQAC-A9 that any further development/update effort will be directed at an ADF-wide level. DG DASA advised recent improved clarity on what constitutes a threshold for development of both Fact Sheets and ACs and publication of enduring information in the future planned DASP Manual Vol3. DASA staff also advised plans to review and aggregate content from some previously cancelled AC's and other documents to support development of this wider narrative. Regardless of its final location, we wish to highlight the importance of developing this additional guidance material to support a wider narrative to the wider regulated community. Hence, **we recommend** that DASA prioritise development and publication of added guidance material to provide a more detailed supporting narrative on DASR-66/147. In line with the above recommendation, **we recommend** that LOGBR (with HQAC AFCAMAN support) develop immediate updates to IET, P-IET and Unit training programs to align with contemporary DASR practices and requirements. These steps could include a re-baselining of previous DASR promotion activity leading to a repeat of the previous "*Educate and unite! A9 AFCAMAN/66 Roadshow – A 'Techo for Techos' information package*" mentioned above.

MAML Issuance – processes, resources, and evolving licensing policy

50.   **MAML Backlogs**. An early issue from all focus group sessions was a significant frustration over large backlogs with the issuance of MAMLs. This backlog has been evident in reporting to Airworthiness Boards (AwBs) and other forums for several years and has led to significant frustration and impacts, including inefficient workarounds, from regulated organisations. DASA staff acknowledged problems with use of the original MAML management tool and had expected resolution after transferring to the new 'FastTrack' tool. FastTrack was developed in parallel at the expense of processing applications within the existing system. Prior to FastTrack going live in Nov 22, the licence backlog had increased from 115 (May 22) to 224 (Dec 22). The FastTrack tool proved to be less efficient, unable to perform batch processing of applications, such that the licence backlog progressively grew to 438 (May 23). In Jun 23, the FastTrack tool was updated to enable batch processing, leading to improved performance and a

---

[24] GovTeams meeting with DASA staff, 8 Aug 23.

reduction in licence backlog to 373 in late Jul 23. This markedly downwards trajectory continued until mid Sep 23 when we see the licence backlog has fallen to less than 20 and has remained less than 30 since then. We note the significant reduction in the backlog and DASA-DCA's plan for future tighter management of backlogs[25]. This includes tighter control and active monitoring of KPIs. **With this DASA management action, we have decided not to include a formal recommendation on this issue**. However, we also note a continuing theme of limited DASA resourcing (both manning and tool support) possibly leading to future rising backlogs. During our review, DASA staff advised plans to seek contractor support[26] (as part of their Strategic Support Contract) *'for processing MAML applications and to assist in maturation (specification development and testing) of the FastTrack MAML tool'*. Notwithstanding this planned activity, **we recommend** that DASA review the mature staffing of the DASR-66 team to ensure sufficient resilience to provide uninterrupted capability support.

51.   Notwithstanding backlog reductions discussed above, we were already examining other options based on feedback from FEGs/Units. We note an early DGTA Discussion Paper titled *'Implementation of EMAR66 Licenses'*[27] included a detailed examination of pros/cons of several options to operate as a MAML Licensing organisation. Discussion had noted that EMAR-66.B.10 requires that States designate their NMAA with the responsibility for *'the issuance, continuation, change, suspension or revocation'* of licences. Importantly, EMAR-66.B15(a) permits the NMAA to delegate licencing activities. The paper considered several options to issue licenses including DASA and other single Service appointments (including contracted support). Following detailed examination, the preferred option was DASA …*'as it produces better and more consistent licencing outcomes, more efficiently than the single Service option.'* However, we were unconvinced of the pros/cons arguments, particularly recognising the potential for a future 'choke point' due to resourcing.

52.   **Alternate options.** Hence we see merit in considering an alternate option for assessment and award of MAMLs – this being to provide a delegation, based on Delegate of the Safety Authority (DoSA) provision already extant within DASR, to an appropriate person in a FEG/Unit[28]. Criteria would limit award only to 'simple' [as in 'not hard to assess'] and 'vanilla' [as in 'expected education and experience'] MAML applications where training received by ADF members will result in them having the contemporary 'licence with exclusions, inclusions and endorsements' profile expected by their respective Service as a result of training mandated by that Service. Such a delegation also aligns with a key principle that was adopted in the mid-90s during BluePrint 2020 implementation and TAREG development where a key driver was the need for a practical and pragmatic framework for the management of engineering in a decentralised environment. Using the principles of PPD (People, Processes, Data), a DoSA delegation would be provided only to carefully selected **people**, using Authority developed/approved **processes**, and Authority approved **data** sources/tools. Any application which exceeds defined 'simple' criteria would still need to be submitted to DASA for assessment per current processes.

53.   In proposing this option, we note that under TAREGs the equivalent function of assessing and authorising technicians to both perform and certify maintenance was assigned totally to the SMM (SENGO) and WOE of the maintenance unit. Under DASR, this function has now been split into two: assessment/award of a MAML performed by DASA, and task authorisation performed within the maintenance unit by the Unit Quality Manager (QM). As the QM is

---

[25] 230616 -MAML Backlog Remediation project-Stats for DASB, BP35472931. 231020 Lamont Pt2 - RE MAML Tool Remediation - Status 13 Oct 23, BP36728737.
[26] 230725 -MAML Backlog Remediation (weekly stats)+future support, BP35472940.
[27] 151005 -Paper - Licence Implementation, dated 6Oct15, BP35472948.
[28] Not suitable for Defence Industry because MAML applications by mature maintainers - initial and update – in Defence Industry rarely meet the criteria of 'simple' and are never 'vanilla'. Also Industry cannot be a DoSA because they are not a Commonwealth employee.

responsible and already conducts much of the preparatory work for submission of MAML applications to DASA, we consider it appropriate to leverage the considerable effort and experience of QMs. This has potential (dependent on QM experience) be a significant productivity measure for what we expect to be a majority of applications. Nevertheless, we accept the need for DASA to continue to assess applications that extend beyond 'simple' criteria. Sampling audits of 'DoSA-issued MAMLs' would be conducted during standard DASR-145/66 audits. Feedback from FEGs/Units on the proposal above varied a little (due possible increased workload) but the majority indicated strong support based on perceived greater control and increased efficiency and productivity due to reduced MAML overlapping processing and review activity.

54.   Accordingly, **we recommend** careful examination by DASA of an option to delegate, using DoSA provisions already extant within DASR, some MAML licencing activity as proposed above. This recommendation is tempered by the practicality of making available a suitable MAML tool which allows 'write' access beyond DASA staff, along with appropriate functionality for follow-up sampling audit, and managing what could be a large number of DoSA (Licencing) staff. If DoSA (Licencing) is adopted, AMC2 to 145.A.35(b) still needs to be retained to allow Defence Industry to temporarily authorise licence holders for 'updates' to their licence, particularly to achieve productivity from newly Type trained personnel.

55.   **Short-term efficiency improvement.** As noted above, strong FEG/Unit feedback sought greater efficiency in the entire MAML application and issuance process. While the above recommendation may take a little time (due to MAML tool update), there was strong support from Units for a priority short-term fix. This could be achieved by providing 'read only' access to Units to confirm member eligibility prior to submitting Form19A for initial issue and updates. Units noted that up to five Form 19A's (MAML Issue/Update) need to be submitted during progression of an average technician during from Fitter to CPL (Initial Cat-A licence application, Type Rating added, Cat-B1/B2 licence update, E62 Exclusion removal, and Cat-C licence update). In addition, more admin workload is created for Unit QM's and DASA associated with sending 'Temporary Authorisation' emails to DASA following successful completion of assessment boards for CRS / Supervision while awaiting formal MAML update.

56.   Unit QMs also reported having had to develop local MAML Eligibility Excel spreadsheets to track members progress, input notes, review/update authorisations and determine when/what MAMLs can be issued/updated when relevant criteria are met. Unit QMs also reported administrative constraints in accessing limited DASA staff (by email/phone) to check local data and other general eligibility requirements and interpretations. Providing 'read only' access to the DASA FastTrack tool would allow faster confirmation of member eligibility and reduce errors in submissions. Importantly, it also has potential to free-up DASA staff time to provide a more responsive 'Help Desk' support service for non-routine matters. Accordingly, **we recommend** that DASA consider developing a standardised tool on the DPN to enable the regulated community to assess MAML eligibility prior to application for a new/amended MAML.

57.   Incidentally, Unit QMs advised that such access does not displace the current need for local unit spreadsheets which will 'always be required' for local technician progress tracking and management. Accordingly, **we recommend** that HQAC-A1/A9 ensure that ERP or other ADF common IT systems deliver the functionality currently provided by the 'local unit spreadsheets' operated by Unit QMs.

58.   While seeking consistency and repeatability in MAML issuing processes, the above measures must also accommodate 'unique' MAML applications that may not neatly fit within pre-defined application types. These unique applications may come from bespoke origins such as lateral transfers or mature age recruits who may have achieved qualifications via uncommon pathways. **We observe** a need to develop repeatable MAML application assessments, while also

improving the handling of 'unique' MAML applications from all origins, including ex-ADF (pre-DASR-66) technicians. This need is illustrated further at paragraph 96.

Management of Deferred Defects

59.   A significant issue raised in all focus groups was a lack of flexibility in the management of Deferred Defects (DD) under DASR. This has caused considerable frustration, particularly in ACG and triggered a detailed examination of this topic by the RT. The debate centres on the restriction in DASR-145.A.48 that allows only 'Certifying Staff', ie Cat-B MAML technicians, to determine if a defect endangers flight safety. Once a decision is made by these Certifying Staff, the second part of the process still requires the CAM (or delegate) to 'make' the actual deferral as the 'Defect Deferral' activity is clearly defined in both EMAR/DASR as a CAMO (ie DASR-M) function, not a DASR-145 Maintenance Organisation (MO) function. This process represents a significant restriction compared to processes under TAREGs that allowed staff authorised by a MO SENGO to make such decisions, taking advice as required, including from the SPO CENGR and specialist staff.

60.   We note that the DASR-145.A.48 restriction is based on the EMAR/EASR requirement that only authorised Certifying Staff can decide, in 'consultation with the CAMO' and using authorised 'maintenance data', whether a defect endangers flight safety. When no aircraft MEL exists, as is the case for all ACG platforms (and many other ADF platforms as well), the Certifying Staff in the DASR-145 MO are required to conduct an 'endangerment of flight safety assessment' (EFSA). This flows from the DASR-145.A.50(a) requirement that issuing a CRS signifies that firstly, '*all maintenance has been properly carried out*' and secondly, '*no non-compliances are known to endanger flight safety*'. If the decision from an EFSA is 'No endangerment', they advise the CAMO delegate to issue the Defect Deferral per the procedure defined in the CAME. However, if the decision from the Certifying Staff in the DASR-145 MO is 'Yes, flight is endangered', DASR-M.A.301[29] allows the CAMO two options if they wish to pursue flight - to seek either a Military Permit to Fly (MPTF) or a Command Clearance (CC).

61.   Noting considerable past history on this topic going back some years that included examination of numerous scenarios during earlier development of the DASA approach to 'adaption' rather than full 'adoption' of EMAR/EASR-66, the RT explored options on this issue with DG DASA and specialist staff. We note that there is **no** debate on the requirement for Certifying Staff to make the decision as a first step, using traditional 'maintenance data' as defined in DASR. We also note there was early debate over the potential use of the considerable extra data often held in SPOs by the CENGR/MTCH, also the CAMO, to assist in assessing hazards/ risks to support a defect deferral decision. This early discussion led to explicit recognition of this extra data as 'Credible data'[30] which is defined in the relevant CAME. However, we observe a key point in this debate being a lack of clarity[31] over who can use this data. A DASA interpretation is that 'Credible data' held by a CAMO/SPO should be passed to Certifying staff in the DASR-145 MO who are exclusively responsible for making the decision. The ACG/SRG view is that formally authorised staff in the CAMO, or delegated in the DASR-145 MO, can also use this data to make an independent defect deferral decision. This would be based on a process enabled by DASR-M.301(a)(2)[32] allowing the CAMO to undertake their independent assessment using credible data using a process defined in their CAME. This process

---

[29] GM to DASR-M.A.301 (a)(2)3, BP35477373.
[30] 'Credible data' defined in GM to DASR M.A.301(a)(2), also in AFCAMAN, B3, Ch4, para 1.4.
[31] GM to DASR-M.A.301 (a) 1 *states 'To meet the demands of operational availability, where it is not reasonably practicable to rectify the defects, provide life extensions or obtain approved repairs, deferred defects may be considered. In these cases, it may be appropriate for the CAMO to defer defects subject to a deferment period using credible data'.* And para 2 *'The CAMO should articulate in the CAME who can use credible data.',* BP35477373.
[32] GM to DASR-M.A.301 (a)(2)1, 2, 3 and 4, BP35477373.

would only assess consequence of the defect endangering safe flight. However, if the defect is determined to *'endanger safe operation of the aircraft'* regardless of possible controls, and deferral is chosen, then it is accepted that only two options remain, ie to raise a MPTF or CC.

62.   The above decision pathway is appropriate and consistent with the definitions, and intent, of the key terms and mechanisms in play, which clearly establish that defect deferral is appropriate only when airworthiness is retained, and that MPTF and CC are extraordinary mechanisms to allow flight to take place when airworthiness requirements are not met, or cannot be verified as met (MPTF), or there is a deviation from the approved configuration, role, environment (CRE). Application of these mechanisms is clear, but debate remains on who can use 'Credible data' to make the EFSA to inform defect deferral decisions.

63.   We decided to explore key points in this debate via the PPD model (ie 'people, processes data'). Firstly, we need to consider the competency standard for defined '**people**'. The DASA historical view focuses on the B-MAML holder who is seen exclusively as the expert who, having completed all training to achieve a MAML including specific aircraft systems Type training, can fully appreciate and assess all systems hazards/risks associated with a defect deferral decision for aircraft inducted into a DASR-145 MO environment. DASA staff, on balance, view this as being the only credible and defensible position as it is based on the EMAR/DASR-66 construct where the B1/B2-MAML holder has been formally recognised as having achieved a level of competency and experience, benchmarked against an international standard. However, we consider this ignores the significant engineer resource that Defence has in CAMO/SPO/ Maintenance Organisations (unlike many civil aviation constructs) with many TQ engineers who also have competencies and experience to make these assessments. This is a resource that can and should be tapped, particularly in complex cases, priority operational situations, and in cases when the aircraft has not been inducted into the DASR-145 MO environment (eg, deployed with limited support).

64.   Secondly, we need to consider available '**data**'. As military organisations, we generally have much more information available to the operator on defects that are not commonly deferred in a civilian environment (particularly commercial operations). Hence, we have competent persons, some highly specialised, in a SPO/CAMO who undertake detailed analysis of data in many forms including FMECA, RCM, PSS, past defect and FSR data, some of which is provided back to the DASR-145 MO in the form of an aircraft maintenance program and maintenance procedures. This higher data set, which exceeds 'maintenance data' as defined in DASR, has already been defined by DASA as 'Credible data'. We consider some of this data may be well beyond what a MAML holder could interpret and apply to an EFSA. Although we fully support the current EMAR/DASR-145 requirement for Certifying staff in the MO to conduct the EFSA initially, we strongly believe that this should not prevent application of available expertise and data resident in a CAMO (including their supporting CASG SPO and contracted Services Provider) in a Deferred Defect decision being taken by the CAMO. However, this clearly needs to be controlled by delegation from the CAM to both CAMO and MO staff as appropriate. This activity also requires that a competency standard be approved by DASA to address this CAM (or delegated) function.

65.   Thirdly, we need to consider the '**process**'. We note that the EFSA process is unique to DASR-145 MOs and was deliberately assigned to be conducted by Certifying staff. However, with ACG's interpretation of the 'CAMO Management' option enabled under M.A.301(a)(2) and defined in AFCAMAN[33] allowing persons formally authorised as 'Defect Deferral Authorities' (DDAs) to approve Deferred Defects, we acknowledge the discussion implying that CAMO staff are also conducting an EFSA. This creates confusion between the EFSA activity conducted by a B-MAML holder and separate action by CAMO (or delegated) staff. This needs to be clarified.

---

[33] AFCAMAN, B3, Ch4, para 1.8 address 'Management of Defects', BP35476149.

We suggest different terminology describing this latter CAMO activity to clearly distinguish it from the EFSA which must continue to be made by a B-MAML holder, duly authorised within the DASR-145 MO.

66.   Lastly, we note some debate and internal legal advice on whether non-alignment with EMAR-145/66 on this topic makes a Deferred Defect decision open to challenge as not being legally 'credible and defensible'[34]. We view the EFSA as an important EMAR/DASR control within the DASR-145 MO environment where Certifying staff are best placed to apply their knowledge using maintenance data in assessing the defect under consideration. However, when the CAMO has formally documented local controls as suggested above (i.e, defined people competency, process, and data used in conducting the Deferred Defect approval [distinct from the EFSA] activity), we consider the use of additional data and the application of expertise resident in a CAMO/SPO to also be credible and defensible and indeed, an enhancement to the credibility and defensibility of the overall Deferred Defect decision process. Importantly and taking a broader view, we note that military operations attract risk assessments in many other areas which make military operations different to civil operations. We also see value in recognising the 'Capability first, safety always' maxim in adoption of DASRs.

67.   Witnessing and examining the healthy debate on deferred defects between and within DASA and the regulated community has illuminated to the RT the importance of maintaining line of sight on the fundamental purpose of DASR which, on our assessment, is to enable safe, efficient, and effective military aviation operations. Naturally the debate has centred on finding an appropriate and complementary balance of safety, efficiency, and effectiveness. At some points, we have observed comparisons with civil aviation operations influencing the debate in ways that risk losing line of sight on the fundamental purpose of DASR. We assess the approach described above that clearly distinguishes the EFSA step (DASR-145 MAML holder) from the overall Defect Deferral decision (DASR-M CAMO Delegate) and allows consideration of all appropriate data by appropriately qualified and authorised people, offers a solution that satisfies all requirements in a safe, efficient and effective manner.

68.   To summarise, **we recommend** further work by DASA to provide further details and clarity on expanded Deferred Defect options as discussed above, including a requirement that appropriate platform-specific 'people competency, process, and data' requirements are defined in relevant CAME, to provide the full flexibility available under M.A.301(a)(2) for aircraft defect deferrals.

Other Matters

Alignment of MAML Exclusions /Inclusions to Maintenance data structures

69.   We received feedback from some MO's on difficulties in applying DASR-66 MAML Exclusions and Inclusions against aircraft maintenance data. The problem arises as DASR-66 Licenses are based on the chapter methodology as defined in S1000D[35]. However, not all aircraft maintenance publications use this standard, including many military aircraft types[36] which

---

[34] 231003 -Email Churchyard-Lamont, Request Legal review +DRAFT Decision Brief for DG-DASA -Operation of Aircraft with Known Defect, BP36968019.

[35] S1000D – an international standard for the procurement and production of technical publications. Further details in the *'DASR-66 Exclusions, Inclusions and Endorsements Manual',* zBP2440847.

[36] Navy's MH-60R initial release of S1000S is scheduled for 1 Dec 23. Army's ARH and MRH use S1000D, UH-60M and CH-47F use IADS4 IETMs (that are not aligned to ATA chapter codes), and no information was provided with respect to the AH-64E. AMG's C-17A, C-27J, KC-30, 737 BBJ, KA350 and Falcon 7X use S1000D ITEMS, the C-130J complies with DEF(AUST)5629C / AAP7000.003 and there is no friction caused by the use of either standard. ACG's FA-18F, E/A-18G and F-35A use MIL-STD-1808 which calls out MIL-DTL-83495 "Detailed Specification: Manuals, Technical – On Equipment Maintenance Manual Set, and MIL-HDBK-863 "DoD

typically use MIL-STD-1808C. This includes all ACG platforms, including F-35, where considerable misalignment and gaps were reported when referencing aircraft systems between S1000D and MIL-STD-1808C chapters. As a result, a heavy reliance is placed on a MAML holder's individual interpretation and cross linkage of maintenance manual chapters back to the S1000D. This is often subjective, leading to technician confusion over the interpretation of MAML certification privileges, a lack of consistency across the platform, and likely incorrect certification practices.

70.   BAES reported investing considerable effort over the last two years (following setup of their F-35 MRO&U depot) to develop a cross-reference matrix that is providing guidance to their F-35 technical workforce. This followed a period of extensive engagement with the DASA DASR-66 team seeking clarification often at individual task or system chapter level. BAES advised that their task is nearing completion with plans to incorporate the matrix in their MOE for DASA approval. ACG have requested a copy for wider application across the F-35 enterprise and ensure standardisation of practices across the aircraft type.

71.   We note that development of an 'alignment' matrix between MIL-STD-1808C and the S1000D standard extends beyond the F-35 capability and has potential applicability to other ADF platforms with maintenance publications based on MIL-STD-1808C. Accordingly, **we recommend** that CASG, in coordination with HQAC-A9, assess this MIL-STD-1808C / S1000D alignment matrix for wider use. Based on the outcome, this matrix will require some 'configuration control' along with education material to support easy reference by MAML holders with certification privileges expressed in S1000D terminology but working with maintenance data structured against a different standard.

72.   A requirement to ensure alignment of aircraft maintenance data structure with DASR-66 MAML certification privileges is flagged as an additional task that needs to be addressed during acquisition of new aircraft Types. Accordingly, **we recommend** that CASG ensure, during acquisition, that if aircraft maintenance publications and TMP are not based on S1000D aircraft system structures, that a translation matrix is acquired and sustained for in-service use. In short, 'create once, use across many Types'.

Review of the Age restriction (21 years old) for 'Certifying staff'

73.   DASR-66.A.15 states that '...*Applicants may apply for a licence at 18 years of age'*. DASR 145.A.35(m) states that '...*the minimum age for certifying and support staff shall be 21 years'*. Australian-specific GM adds that *'the minimum age limit...only...refers only to the issuance of a Certificate of Release to service (CRS) for on-Aircraft maintenance'*. Feedback during our Review questioned the need for this latter age limit of 21 years old (21-yo).

74.   In examining the background to this age limit, we note that this topic has been re-visited on a number of previous occasions, primarily from a Defence personnel development perspective. A short summary follows:

   a. *(2016) - Rank is not necessarily the best criterion on which to judge an individual's suitability to make airworthiness determinations. Rather it is the combination of the individual's skills, knowledge and attitude. However, it is difficult to regulate 'skills, knowledge and attitude' and regulators use the somewhat indefinite term 'competent' instead, supplemented with further qualifying criteria such as rank or* age.[37].

   b. *(2017) - In the trilogy of 'qualification, training and experience', age is a proxy for experience, however Defence's career development through qualification and training, and*

Handbook: Wiring Data and System Schematic Diagrams Preparation of". SRG P-8A, E-7A, AP-3C. Hawk-127 uses MIL-STD-1808, and no information was provided with respect to the PC-21.
[37] 160830 - Brief - Licence Implementation, BP35479663.

controlled employment experiences, accelerates the competence of an individual - reflected in career/remuneration progression – and are a better benchmark than 'age' alone.[38]

c. *(2018) - The following are considered pertinent to this change proposal[39]:*

• *While some variances exist, the generally held principle in Australian law is that a person reaches the age of majority at 18 years. That is, a person is considered to have sufficient capacity to derive action and consequence and legally held to account as an adult from this age. Where variance exists, the principle is applied to persons 17 years of age.*

• *The Defence Force Discipline Act applies to all ADF members regardless of age.*

• *Clarification provided by a Senior Standards Officer -CASA, identifies the rationale behind JAR-66 determination that "young people (U21) could have considerable difficulty in resisting Commercial pressures, particularly on the Flight Line and it was more a question of maturity rather than technical confidence (in restricting certification privileges to personnel over 21)".*

• *ADF employment policy permits recruitment of technical trainees from 17 years of age. Technical trainees are therefore able to demonstrate the level of competence required to be issued a MAML prior to 21 years of age.*

75. We view the EMAR-145.A.35(m) 21-yo age limit as providing a balance of several issues in the original intent of the EASA Part 145/66 management system. The higher age limit for issuing a CRS (noting that the Licence may have been obtained up to three years prior) is designed to complement an EMAR-66 construct where a licence can be obtained via self-study and examination, followed by 'experience'. This is unrelated to the Australian competency-based system or the ADF personnel development system, both of which tightly define required 'experience' and an assessment of 'knowledge, skills, attitude and aptitude' of technicians. As a result, when a Licence is obtained on the basis of Australian Units of Competency, we consider that the EMAR-145.A.35(m) 21-yo age limit should **not** be applied to MAML holders.

76. Review and removal of the 21-year age restriction was widely supported in focus groups and feedback, particularly in the context of a Cat-A licence pathway to encourage youth into aviation employment. The general Industry view was that, while a 21-yo age limit is appropriate for B-MAML staff recognising platform experience and knowledge requirements, it is **not** necessary or appropriate for A-MAML staff.   The logic provided was based on a number of Industry initiatives to grow their own local workforce and provide a sustainable pathway towards achieving a Licensed outcome. BAES quoted an ideal starting point as being a high school graduate becoming a Cert-II recruit and potentially completing the required training for combination of Part M and 145[40] tasks at age 18. After gaining adequate experience, maintenance training for a Cat-A license could be completed by age 19. Cat-A maintenance is, by definition, 'simple' with no need for platform systems courses. The current 21-yo age limitation denies this potential source of maintenance resource and forces more experienced employees back to 'line maintenance'. Incidentally, we also note that the UK MoD has recently removed the age restriction[41].

---

[38] Description of 170223 1830hrs Slide 2.3- DASR66 Landscape - DG DASA briefing, U9447954.

[39] 181129 DASR Form 111 DCP 2018-082, BP35536329.

[40] Reibel correspondence of 6 Jul BP35472916 and 29 Aug BP35483030. The 'ideal' use of the Cert-II Aircraft Line Maintenance (ALM) recruits performing a range of tasks that cross between Part M and Part 145. Part M duties including: preflight, replenishment, and launch / recovery / turn around servicings; Part 145 duties Including; A Class maintenance as identified in the BDA FA18 MOE Handbook (currently 35 tasks), and assist MAML holders as required as AMO staff. The maintenance policy for the FA18/EA18 aircraft are driven by days elapsed and are broken into a multitude of smaller / simple tasks with an aim to keep the aircraft ready for flight. Having the Cert-II ALM team complete these P145 tasks independently (along with the Part M tasks) provides the ultimate efficiency. This concept would provide alignment with the intent of DASR and the construct of CAMM2.

[41] NAA_22_11_Redacted - removed 21yo from RA4807(13) in May 2022, BP34260437; and, RA4807_Issue_6 BP34260426.

77.   Accordingly, recognising that DASA received a recent request[42] to reconsider the matter of a restriction, **we recommend** that DASA seek, as a minimum, legal opinion on the validity of the current age restriction for Cat-A MAML holders and, if no objection to change, revisit the current age restriction with consideration to adjusting the Part 145.A.35(m) 21-yo limit[43].

PART 3 – DASR-66/147 IMPLEMENTATION BY ADF AND DEFENCE INDUSTRY

78.   As noted earlier, Part 3 of this report focuses on implementation of DASR-66/147 by ADF and Industry as listed in para 12b of the Review TOR. This includes several TOR sub-paras focused on DASR-147 MTO training design and delivery. Although we have addressed a number of wider implementation issues from focus group feedback in Part 2 above, we wish to initially examine some broader themes specifically related to *'issues and constraints limiting the realisation of benefits as intended by the Air Force Board's deliberate decision in 2013 to introduce DASR66 and DASR147'* (per TOR 12b (iii)). Broadly considered, we have grouped them under the following six major themes and addressed each individually below.

   a.   Recognition of foreign/ex-ADF military maintenance technicians under DASR-66,

   b.   Lack of alignment of IET and some P-IET with DASR-66 requirements,

   c.   Lack of alignment of current aviation trade structures with DASR-66 licenses (particularly Air Force trades, less so with Army and Navy),

   d.   DASR-66 Licenses for Specialist Trades – ARMTECH and ASTTECH,

   e.   DASR-66 Implementation in Navy, Army, and Industry, and

   f.   Maturity of DASR-147 MTOs.

Recognition of foreign/ex-ADF military maintenance technicians under DASR-66

79.   Head-lining the list was a significant level of frustration that we received stating **DASR-66/147 implementation has been a strong disincentive and barrier to the recruitment and employment** of mature-age experienced technicians, both foreign laterals into the ADF, and ex-ADF and some civilian technicians into Defence Industry.   We view this issue as an 'unintended consequence' of DASR-66/147 implementation and found this to be the most frustrating and disappointing area of focus group feedback that we received during this entire Review. It also runs counter to a major selling point of DASR in the pre-implementation phase. We will address this feedback under several headings:

   a.   Recognition of foreign technicians for short-term employment (primarily ADF),

   b.   Recognition of foreign technicians for longer-term careers (primarily ADF), and

   c.   Recognition of ex-ADF technicians for longer-term careers (primarily Industry).

80.   All FEGs raised concern and frustration with the process for recognition and employment of foreign military technicians under DASR-66. Senior staff also highlighted the reality of some recent experiences directly challenges the claim that implementation of DASR-66 provides the potential for **increased** interoperability with coalition forces. This claim is based on supposed recognition and alignment of DASR to other international civil and military airworthiness systems. After looking closely at several case-studies, we decided to present details as two subsets: **short-term** employment and **long-term** recruitment.

---

[42] 231002 Lamont RE DCP 2023_035 FastTrack Reference, BP36443820.
[43] Noting the very low likelihood of an Australian-trained person following a Cert-IV or Diploma pathway becoming eligible for a Cat-B MAML before they reach 21-yo, the relief provided by this recommendation is likely to only affect Cat-A MAML holders.

Recognition of foreign technicians - for short-term employment (primarily ADF)

81.   Several FEGs/Units have employed foreign military technicians in recent years – particularly SRG (primarily RAF technicians supporting E-7) and ACG (some UK /US technicians supporting F-35). Separately, we note that Army is considering engaging a number of US Army technicians in a local Army DASR-145 maintenance organisation to support the incoming Apache (AH-64E). As a result, Army is also interested in simplification of future processes. To understand SRG and ACG frustrations and concerns, we examined recent experiences in SRG and ACG which are presented separately below.

82.   **SRG employment of RAF technicians for E7 support**. We note considerable correspondence between SRG and DASA going back around 12-18 months over a lack of clarity in DASA recognition avenues to allow the certification authorisation of foreign trained military personnel (specifically UK). Issues are well covered in a DG DASA Decision Brief titled *'Maintenance Certification when DASR-66 Requirements NOT Met'[44]* (dated 11 Oct 22). This Brief also contains eight paragraphs that had been drafted as FAQs intended for publishing to the wider regulated community. Although content in the Decision Brief was agreed, proposed FAQ content has not yet been published. However, a DASA Factsheet which attempts to cover much of the FAQ content has been drafted and circulated to FEG CAMs for comment on 18 May 23.

83.   We note considerable feedback on this draft DASA Factsheet from FEG CAM's which includes varying levels of unease and concern over some content. We consider one of these, SRG CAM's response[45] to be very relevant to ongoing consideration of this topic and have highlighted a number of points inviting careful DASA consideration. Some key points follow.

   a.   Comments on MAO frustration over how flexibility provisions are applied, citing an apparent flaw in logic that the MAO/AM must request approval from DASA to use flexibility provisions. SRG have proposed a change requiring that a MAO/AM must 'inform DASA' only.

   b.   Comments on strategic context related to the recent Australian Government DSR which includes a strong focusing on agile operations and strategic intent to fight as part of an integrated force. This requires that the MAO/AM and CAM must be empowered to make risk-based decisions to meet capability requirements. This point aligns with some earlier discussion (paras 70-79) in recognising the inherent nature of military operations as requiring potentially greater risks on occasions, but always subject to careful risk-based assessments and local risk-retention independent of DASA.

   c.   We note that SRG propose some 'green text' GM to DASA *'Basic Reg GR80 -Flexibility provisions'* related to certification authorisations to personnel without a MAML. We are comfortable with and endorse the intent of this proposed guidance material.

   d.   We also note reference to SRG enhancing the current process that they have already successfully implemented for embedded UK personnel, termed 'NMH' (Non-MAML Holder)[46].

We will not attempt to capture or comment on feedback from other FEG CAMs, instead we simply highlight the active discussion and defer to DASA staff consideration and ongoing consultation with CAMO staff.

84.   **ACG trial to employ USMC techs for F-35 support.** Shortly before our focus group session at RAAF WLM, ACG conducted a trial in May 23 to examine the extent they could use foreign military maintenance technicians to perform and certify maintenance on our ADF F-35

---

[44] 221011 -DG Brief -Maintenance Certification when DASR-66 Reqmts NOT met, BP35472955.
[45] 230619 -DRAFT DASA Factsheet= DASR-145 Authorisation of PERSONNEL in a DASR-145 MaintOrg =SRG Response, BP35472959.
[46] ACG SI(LOG) 07-08 -ACG Certification Staff and eRTE Management, paras 7 and 14-17, BP35472944.

fleet under DASR-145/66. ACG's primary objective was to assess the extent of Interoperability under DASR with foreign forces - in this case USMC. ACG provided details and lessons-learned from this trial in the focus group session. To best capture detail, we invited a follow-up submission from 3SQN. Rather than summarise, we see value inserting the response below[47].

> *3SQN has just completed a period of four weeks entwined with USMC VMFA-314 who maintain and fly F-35C. This partnership was purposefully initiated to test maintenance interoperability. Discussions within 3SQN and 81WG Maintenance Execs identified that due to limited preparation timeframe, being able to authorise VMFA-314 maintenance personnel to **certify** for maintenance tasks on RAAF F-35A jets was **not achievable**. Informed via our recent observations navigating recognition for our lateral UK recruit (described below), the regulatory requirements pertaining to the necessary training and underpinning knowledge/experience for certifiers are very specific and highly complex.*
>
> *In the absence of significant investment of research and effort at the unit level (this effort needed to be balanced against the imperative of continuing to execute the squadron's assigned mission of the day) it appeared DASR 66 did not incorporate sufficient flexibility or provisions to enable practical and timely authorisation of allied partners as certifiers on Australian aircraft. Hence, **3SQN authorised VMFA-314 personnel as Tradespersons only,** conducting Jet launch/catch and basic rectifications – nil certification.*
>
> *Future concepts surrounding maintenance interoperability extend further than what DASR 66 would appear to allow. Operational scenarios exist where there are no RAAF maintainers in a location to conduct and certify for maintenance on a RAAF platform where allied forces who operate/maintain the platform are present. **We need that flexible, interoperable approach that allows us to act on the situation rapidly and with confidence.** Do we have a mechanism that will allow this? I don't believe we do through DASR 66. If there is a process, I respectfully request information to allow rapid progression in this field as we move on further planning with allied partners in maintenance interoperability.* [**RT emphasis**]

85.   The concluding comments above include a number of questions which are outside our TORs and we defer to ACG MAO and CAM to address. However, **we observe** and wish to, once again, highlight the different strategic environment in which military operations are conducted compared to civil operations. We fully support a requirement for a military aviation regulatory suite (ie, DASR in this case, specifically DASR-145/66) to provide maximum mutual recognition with allies for the use of foreign trained personnel and, when that is not possible, workable Flexibility provisions in which Commanders can assess and manage risk that cannot be retained by continuing airworthiness regulations. In reflecting on the original purpose of migrating to the DASRs, an adaptation of the EASA regulation suite, coupled with the robust professional 'people, processes and data' inherent to the Defence Aviation system, leads us to conclude that implementation of well-considered flexibility provisions to unlock the benefits of mutual recognition is both appropriate, and necessary in the current environment.

Recognition of foreign technicians - for longer-term careers (primarily ADF).

86.   Several FEGs/Units have sponsored expressions of interest from foreign military technicians for lateral recruitment. The experience of several lateral transfers (both CPL rank) from the RAF have provided two case-studies that highlight unnecessary barriers to obtain a DASR-66 MAML. Experience from these two case-studies (from ACG and AMG) directly challenges the high-level objective of increased flexibility for recruitment and employability of international military aviation technicians based on organisational mutual recognition under DASR at a national level. Senior ACG/AMG CAMO and SQN staff provided significant assistance to both these technicians (with F35 and C130J backgrounds) in engaging with DASA

---

[47] Complete submission at '230726 -Email -ACG - 3SQN -Issues (incl Lateral Transfer), BP35472926.

staff seeking a process whereby their past qualifications, training and considerable experience in the RAF could be recognised and provide the basis for issue of a MAML under DASR-66. Details of each case study, as provided by ACG and AMG staff, are presented below (with names removed) to provide context for subsequent discussion.

87.   When we explored the ACG case-study, it appeared well known and was regularly referenced within the large group (around 40+) of ACG SNCOs and CAMO/Unit maintenance officers in the focus group session at RAAF WLM. To best capture CPL X's story, we have inserted the considered statement that I sought and received from ACG (WOFF) to describe his experience and outcome.[48].

> *With regard to CPL Xs situation: I'm concerned of the potential negative impact to prospective UK Lateral Transferees that have been influenced by CPL X's struggle to gain a MAML and certify for tasks. CPL X was performing roles up to and including SGT in the RAF with substantial experience (10yrs) on F-35B who was informed by RAAF Lateral Recruiters that there should be no issues recognising his certification/licence qualifications and he would only need to conduct Trade Supervisor Principles Course and PMET. What he was advised, and the reality of the process he was subsequently subject to were completely different. Over the next few years CPL X faced a continual struggle. The experience has left him extremely disappointed in the process. As a result, CPL X has now decided to cease being an Avionics Technician as he feels his career has stalled over the last few years and is pursuing other interests not originally intended. DASA previously advised[49] CPL X that the only pathway he could execute in order to attain a MAML was via significant training (attend RAAFSTT/complete Diploma. Noting the earlier advice received while laterally recruiting, and CPL X's extensive RAF training, qualifications and experience, this pathway (understandably) was unexpected, and considered to be disproportionate and unreasonable. While the process for authorisation of certification as a Non-MAML holder is now clear, there is still a training overhead should the member depart from RAAF to Civilian Aviation and the feeling of being different to his peers for not having a MAML whilst in the RAAF would always exist.*

> *Importantly, in addition to the personal impact this process has had on CPL X, he also advises that his experience and response from DASA has contributed to a decision from at least five other UK members to not initiate their application for Lateral Transfer. These personnel also have significant F-35B experience that would provide significant relief to the current workforce issues being experienced within 81WG. I suggest this outcome comprises a significant strategic "own goal" for 81WG and the broader Air Force.*

> *The current and near future of F-35A within Australia involves heavy corrosion remediation and large-scale Avionics modifications. Our workforce is thin and fragile at the NCO/Certification level and any assistance via Lateral Transfer should be strongly encouraged with support from DASA to increase/widen recognition of Certification authority. We simply cannot afford to have processes that make Lateral Transferring difficult and/or unattractive.*

To add context to the comment that *'the process of authorisation of certification as a Non-MAML holder is now clear'*, this refers to the process now defined in ACG SI's[50] under the title of 'Non-MAML Holder' (NMH). Importantly, this process does not yet provide a pathway to long-term achievement of a MAML under DASR-66 without under-taking the 'significant re-training' that

---

[48] Ibid – 230726 -Email -ACG - 3SQN -Issues (incl Lateral Transfer), BP35472926.
[49] This statement is questioned by DASA staff. In follow-up, the RT was unable to substantiate the source organisation of the cited 'need to complete a Diploma'. However, this does not detract from the perception that was not corrected, and the subsequent wasted effort. The fact is that a Diploma is **not** required for a DASR-66 MAML.
[50] ACG SI(LOG) 07-08, para 7-8 …summarised as 'Foreign trained personnel who have previously held a certification authorisation under an airworthiness framework recognised by DASA, may be authorised as a NMH for an equivalent authorisation level under GR.80(c), up-to the scope of the authorisation held within the recognised aviation framework, BP35472944.

was quoted above, but DASA are taking action (refer Observation at para 102). This provides added context to the comment above on CPL X's future career prospects and not being treated equally with his RAAF peers.

88.   The AMG case study is a recent RAF lateral transfer (CPL Y) with a C-130J background who obtained a MAML following RPL by Aviation Australia and completing a number of Units of Competency (UoCs) in the workplace. Her experience, and its duration, are considered sub-optimal from two perspectives: firstly, the duration largely due to administrative delays, and secondly, the requirement to obtain a Cert-IV rather than the minimum quanta of UoC required for a Licence. The 19-month 'journey' was composed of 10 months after arriving at the unit (31Jan22) for CPL Y to have her RPL application for initial assessment accepted, a couple of months to determine the gap, then a further four months to complete other UoCs, finally receiving a Cert-IV in mid-June 23 followed by a Cat-B MAML in Aug 23. The initial assessment completed in Jan 23 concluded that after CPL Y had completed Unit of Competency ('*Participate in Environmentally Sustainable Work Practices*'), she would be eligible for a Cert-IV in Aeroskills (Avionics). CPL Y obtained RPL for all other MEAs with no further study or examination required beyond the 'environmental work practices' training. However, we note recent confirmation by DASA staff that MSMENV272 *Environmentally sustainable work practices* is **not** required to satisfy a DASR-66 Module, but is required to attain a Cert-IV. The requirement for a Cert-IV comes from the DASA '*DASR 66 Exclusions, Inclusions and Endorsements Manual*', page 6, 'Notes to Readers'. The RT confirmed[51] with DASA staff that CPL Y could have received a Cat-B MAML with more exclusions and less Inclusion compared to her current MAML, in Jan 23 (a saving of seven months) if recommendations below are adopted. If the flexibility of GR 80.(c)[52] had been in use when CPL Y arrived in Australia, this would have allowed her, soon after joining the Unit and completing a few months local orientation (including Module 10, Australian Supervision, CAMM2 etc), to be '*authorised to issue a CRS without holding a MAML*', significantly reducing lost productivity.

89.   To summarise considerable discussion, CPL Y provided the following comments:

> *As you can see this has been a lengthy process. 37 SQN UTC have been brilliant with trying to figure out what was needed and how they could speed the process up. I think there is a massive lack of knowledge within the squadron in terms of lateral recruits, no one really knew what to do with me. It has been very confusing.*

> *An 18 month delay has been beneficial as it's given me a good amount of time to adjust the RAAF and 37 SQN processes, however the delay has knocked my confidence as I hadn't been exercising my previous role. I think a lateral recruit could be treated like someone being posted from another squadron with a little extra time to learn Mod 10, CAMM2 etc.*

> *The answer to your question; 'Would I have been confident to sign TSO and CRS[when first posted to the SQN]?', yes I would have.*

Her SNCO manager, who confirmed details provided by CPL Y, added (inter alia):

> *Hopefully the points above give you some indication into the frustration and struggles there has been in obtaining CPL Y a Cert-IV and ultimately a B2 MAML.*

---

[51] 231006 Lamont email RE: CPL Y - Theoretical Licence based on the Aviation Australia RPL AVIF/MEAs. BP36447365. The current FastTrack tool does look for the completion of a Cert-IV as the current minimum standard for a Cat-B MAML. However, DASA are still able to issue a MAML if an applicant has completed an equivalent to a Cert-IV (e.g. all necessary MEAs less MSMENV272 environmentally sustainable work practices). For the case of CPL Y, the resultant licence based only on the Aeroskills UoC awarded by RPL when seeking to attain the Cert-IV Avionics would have (compared to CPL Y's current Licence): three exclusions added; E31 – Cabin pressurisation, E34 – Digital systems, and E63 – FADEC; and, four Inclusions removed; I-2 Oxygen systems, M4.1 – Attack and self-protection systems, M5.1 – Surveillance systems, M8.1 – Electronic warfare systems. The latter four Inclusions were all completed in Unit, over four months as 'other UoC'.

[52] 221011 -DG Brief -Maintenance Certification when DASR-66 Reqmts NOT met, BP35472955.

We observe that DASA staff have subsequently identified a number of systemic improvement opportunities that could have hastened CPL Y achieving her MAML following RPL, and intend to refine[53] the *DASR 66 Exclusions, Inclusions and Endorsements Manual*.

90. The two case studies above raise a number of significant issues which we wish to explore below. Firstly, there is a need to clarify the messages provided to relevant staff on potential employability under DASR for lateral recruits from both the UK and other foreign militaries (including USA). As this topic is outside our Review TORs, **we invite** DG DASA or AFHQ / potential FEG sponsors to consider action to clarify DASR-66 license requirements and 'expectations versus reality' upfront.[54]

91. Secondly, we see an important need to define a generic process for recruiting or 'onboarding' of foreign trained laterals for all three Services. Hence, **we recommend** that AFHQ (LOGBR), Army (AVNCOMD) and Navy (HQFAA) establish generic Service specific processes for the 'on-boarding' of foreign-trained lateral aviation technicians to streamline the process and minimise the administrative delay evident in current practices. This process needs to provide specific details for military transfers from the UK and USA, including detail on education/trade/service artefacts required from the respective UK/USA system, pre-budgeted resourcing for both RPL assessment and any resulting gap training, responsibilities for artefact collection (at the earliest opportunity and submission to organisations to enable prompt administrative action), RPL initiation, early engagement with DASA by DFR/Unit Training Coordinators (UTCs) for case-by-case query resolution to assist in timely administration. To assist UTCs and to ensure a standardised practice across Air Force FEGs, the AFHQ process should be published in the AFCAMAN, or equivalent centrally controlled Air Command document.

92. Thirdly, and to assist in establishing a possible long-term solution to greatly simplify the future recognition and acceptance of UK lateral recruits, the RT (specifically my assistant GpCapt Crowe) conducted a 'deep-dive' examination of the UK MAA system and specific processes for authorisation of technicians - full details are presented below and later in Part 4, paras 190-192). As a result, we raised some targeted questions which were presented (in the first case study above) to CPL X on UK MAA-recognised artefacts that we expected he should hold. He advised that he was very familiar with, and held, all artefacts and that some had been provided to specialist DASA staff when requesting issue of a MAML. However, as they 'did not meet DASA criteria', nothing was achieved, with the outcome as recorded above. Only a DASR-147 MTO can make an RPL assessment against DASR-66 requirements; DASA is not a DASR-147 MTO.

93. As we consider this to be a highly sub-optimal outcome for both CPLs in both case studies above and also future potential UK lateral recruits, we have documented our assessment of the UK MAA system and provided this in **Annex E**. In it, we identify the point of convergence within the two systems, specifically the UK *Certification of Air System Release (CASR)* and Australian *CRS* which has common intent and common outcome, but with different education and experience pathways to meet entry criteria. While DASA confirmed that the

---

[53] 231002 Lamont - MAML maturity activities FastTrack MLTT-0059, BP36446030. If DASA moves away from using Cert-IV (ie, applying the Australian competency-based education approach) as an entry criteria for a Licence application, and focus only on the UoC that achieve Part-66 Module 'Basic Knowledge', then waste is removed from the Licencing system. UoC provide a sound basis for authorising a person for Task Sign Off (TSO) on various aircraft systems and, whether at Cert-II, Cert-IV or Diploma level, allow for the progressive TSO authorisation of individuals as they attain the competence before completing the whole qualification. When UoC are reformed to better reflect Part 66 Module outcomes, then training waste will be further removed from the trade education and licencing systems.

[54] DASA staff advise a 'Minute – TECHWF WCA Advice for Overseas Lateral transfers' BP33384658 forwarded to DP-AF on 29Jun23. However, we note this issue presented a 'request' and suggest wider promotion to impacted community.

extant 2018 'Airworthiness Recognition of the Military Aviation Authority of the United Kingdom' is complete and no further recognition is possible, **we observe** that there is opportunity with UK Defence personnel for standardised use of DASR-GR.80(c) flexibility provisions.

94.   **We recommend** that, in support of future use of DASR-GR.80(c) flexibility provisions, FEGs consider the 'blue text' offered in **Annex E** during their assessment of UK maintainers, who do not hold a DASR 66 MAML, when considering their authorisation as Certifying staff in a DASR-145 MO.

95.   Following consultation during this Review, DASA have identified an alternate approach to assessing UK defence maintainers[55] which is described below:

> A recent CASA/DASA 147 Maintenance Training Organisation (MTO) RPL assessment for an ex-UK Defence maintenance technician resulted in the award of an Aeroskills Cert-IV with minimal additional training. This has highlighted the potential for functional mapping of the UK defence Aviation maintenance training, against Australian Aeroskills Vocational Education & Training and/or DASR-66 modules, that could result in the award of a DASR-66 MAML. This mapping would likely be achieved via an initial CASA/DASA 147 MTO RPL assessment but, once established, could avoid the need for repeated CASA/DASA 147 MTO RPL assessments for applicants with a common training background. In practice this could simplify and expedite the achievement of a DASA-66 MAML for appropriately qualified UK defence personnel seeking employment in the ADF. It would also provide a better working knowledge of our respective aviation maintenance training systems that would result in enhanced aviation capability interoperability outcomes with the UK MOD. Based on CASA/DASA 147 RPL assessments, or a dedicated mapping activity, DASA would develop and maintain a list of UK MOD training outcomes that could be used as direct evidence for assessment of a MAML. It should be noted that this process should be considered for other nations only after a similar successful CASA/DASA 147 MTO RPL assessment identifies that the foreign training system is fundamentally aligned to the DASR-66 MAML outcomes.

96.   However, **we observe** and wish to highlight that the proposed DASA alternate UK assessment approach described above does **not** apply to any potential US military lateral recruits. Instead, separate assessment criteria and a bespoke process for attaining a MAML needs to be developed and flagged prior to any potential employment / career option being offered to potential US military lateral recruits. HQAFTG should be (see para 162) enabled to conduct the challenging activity of understanding and assessing the US aviation trades training system, informing the three Services and Defence Force Recruiting.

97.   In addition to the recommendation above (para 91) that specifically address the circumstances that led to sub-optimal outcomes in the two case studies, **we observe** that the current DASA guidelines for assessment of MAML applications such as the DASA '*DASR 66 Exclusions, Inclusions and Endorsements Manual*' do not adequately accommodate the unique circumstances of all potential MAML applications. As was required during the implementation process, common 'equivalence' benchmarks feature in current DASR assessment processes which are appropriate and beneficial to the majority of MAML applications. However, the opportunity to use benchmarks (such as Cert-IV) to establish equivalence should not be confused with a definitive regulatory requirement to meet the 'equivalence' benchmark as alternate means may exist to meet the regulatory requirement, or options to issue a MAML with restrictions that are acceptable to the applicant. The case studies reveal this to be case for two laterally recruited ADF members; we expect other 'novel' circumstances where this issue may apply in the future beyond just lateral recruits.

---

[55] 231123 Lamont - DASA's alternate to UK recognition, BP37449609.

Recognition of experienced ex-ADF maintenance technicians employed by Defence Industry

98.   A number of submissions from Defence Industry highlighted frustration over DASR-66 being a barrier and disincentive to employing past highly experienced ADF technicians that had left the ADF prior to getting a MAML. If a MAML (with Exclusions) had been obtained previously, a MAML update could be issued after completing relevant Type training. However, regardless of extensive past ADF experience, if without a MAML, they were now being advised that they, in effect, *'needed to start from near scratch again as an apprentice'*. Industry cited a number of examples which were similar to sentiments provided by Airbus[56], where attempts to recruit technicians have failed totally with applicants rejecting offers with comments like *'needing to totally restart a career'*. In response to our request for further documented examples, one Industry MO provided the RT with information on four applicants but, after checking with DASA records, none were substantiated.

99.   We note that during the transition period prior to March 2020, DASR-66 included a 'grandfathering' clause that accepted technicians not having the specified education background to meet 'Basic knowledge' requirements. We fully support applying limits to the concept of grandfathering in that it sets a hard barrier that forces the need to establish a training system and a clear educational pathway to meet DASR-66 requirements. This applies particularly to younger applicants who have a considerable career in front of them. However, we also see value of a trade-off being applied for later-career applicants who have recorded considerable past ADF experience, are now re-joining the aerospace workforce but have a limited working life. This would include re-instatement of a provision to 'grandfather' ex-ADF technicians, not automatic, but only those with a profile that, had they applied for a MAML between 2017-20, would have been eligible for a MAML with Exclusions at the time. In coming to this position, we hear the oft-repeated question: *'...why waste that experience, how long are they going to be around, would they really disturb the system ...what is the risk?'*.

100.   Recognising the significant disincentive and barrier reported to recruitment of ex-ADF technicians reported by Defence Industry, **we recommend** consideration by DASA for re-instatement of a provision to 'grandfather' ex-ADF technicians with a profile that, had they applied prior to past expiry of this relaxation in March 2020, they would have been eligible for a MAML.

Recognition of domestic civil maintenance technicians under DASR-66

101.   As mentioned at sub-para 24d, DASA are working towards formally recognising CASA Licences and artefacts, followed by mutual DASA-CASA recognition. The gap between civil and military aircraft will require some CASA LAMEs to complete Type and OJT before a licence is issued. Looking at possible extremes, a LAME remaining in their B1 or B2 Category and holding a civilian Type rating that is the same or 'close' to a military Type (such as B737 for employment on P-8 Poseidon) has little imposition as the civilian Type is recognised as a 'first Type'. Looking at the other end of possible extremes, a LAME from the GA community with a Cessna Type rating will require both Type training and six-months OJT as the civilian Type has little relevance to the military fleet. LAMEs seeking a Category change (for example B1.1 to B1.3) will require basic knowledge and experience, plus their rotary Type training and associated OJT. We consider this training liability is a reasonable approach and proportional to the significant shift in a maintainer's career.

---

[56] 230227 -Airbus input to DASR 66+147 TORs - BP35684975.

Lack of alignment of IET and some P-IET with DASR-66 requirements

102.   A lack of alignment of Initial Employment Training (IET) at RAAFSTT Wagga with DASR-145 and -66 requirements was raised regularly in feedback from Air Force groups. We note considerable history on this topic going back to some early DGTA Research papers already discussed above in Part 1. We note that HQAC-A9 are leading a holistic assessment of workforce, training and capability needs[57], but the RT is unaware of how, or in what timeframe, this will lead to any action to optimise workforce training.

103.   Army and Navy have already introduced a number of changes to the IET of their aviation technicians and are more advanced than Air Force in this area. A choice of pathways is also under active consideration for further refinement of their respective workforce requirements.

104.   A considerable variation is evident between the three Service's workforce training management by examining the relative maturity of fundamental workforce management documents. Looking at the extremes – specifically Army and Air Force – **we observe** that Army has executed activities[58] that generate B1.3 and B2 licence holders without Exclusions, are generating a number of dual-licence B1.3/B2 holders, are removing Exclusions from the legacy workforce, and are considering the utility of a development pathway from Cat-A licence at entry to progressively achieving a Cat-B licence. These activities are all aimed at optimising Army's aviation workforce[59] for the differing maintenance liability expected with new attack and utility aircraft.

105.   In contrast, Air Force has only recently updated its Employment Profiles (EPs) to provide a development pathway for its aviation technicians. EPs could be viewed as a 'specification for the product' (ie trained technicians) that Air Force is seeking, starting from its initial training provider (operating under contract at RAAFSTT) and continuing to post-IET (P-IET) provided within FEGs. Hence contemporising its EPs is an important early activity to defining future trained workforce attributes. Until late May this year, EPs were rather dated[60], with LOGBR-AF self-assessment on this topic being:

> *Job roles, duties and responsibilities (at a high level) are listed in annex B of the EPs and detail the progression …throughout the ranks. Annex C of the EP …details the requirements for progression, for both rank and skill grade progression. Current EPs …are largely out-of-date with the most recently released EPs (ALSFITT and ARMTECH) dated 16 Aug 19, whilst the ASTTECH EP is dated 24 Oct 12. … Note updated versions are currently in work, and potentially released later this year – however current versions should provide sufficient context.*

Depending on the outcome of HQAC-A9's separate review (refer paras 66-68 below), these documents may require further priority update.

106.   **We observe** that Air Force is clearly trailing Army and Navy in aligning IET with DASR-66 requirements. We also had disappointing feedback that training at RAAFSTT was still based on TAREG and dated AAP7001.059 processes and terminology until April 2022 when training

---

[57] 221101 -Brief for DACAUST: AFCC Action Item 220513/04 – DASR 66 Alignment for Technical Trades of 1 Nov 22, BP35472994.

[58] 201009 - Business Case - Fully DASR Aligned B1.3B2 ITT, BP3558123; 210205-Minute-AAvnTC-DASR Aligned IET Training Trial marked, BP33506886; Training Transformation Analyse Phase Report - Part 3. AEROSKILLS, BP32206981; 220317 Progress Report - Specialist Service Soldier Trial of RAEME Aeroskills Technical Specialists (ATS) of 17 Mar 22, BP33506890; 220701-HQAVNCOMD-Report-Future Aeroskills Workforce Design - Final Report-PROTECTED marked up, BP35502947; 220927 APCSG Task_SSST FIC Analysis Noting Brief _AVN Perspective#2 marked, BP35538569; and 221123 - AAvnTC slideshow ATS update Brief - 23 Nov 22, BP33506986.

[59] 221117 COMD AVNCOMD Guidance for Strategic Workforce Review – Al1 of 17 Nov 22, BP33506987; and 221128 Army Aviation Capability Review Environmental Scan Report of 28 Nov 22, BP33506985.

[60] 230516 -DEM(DGLOG) RFI Response -extract. However, we later noted that a number of EPs were reissued in late May, BP35472951.

was updated to reflect DASR terminology and concepts. We note that activity in this area is outside DG DASA's remit. Nevertheless, **we recommend** the Authority's next oversight activity of RAAFSTT confirm that IET course material has been fixed by AFTG and delivery reflects current DASR terminology and concepts.

Lack of alignment of current trade structures with DASR licenses

107.   Similar and partly related to the topic above, we note a lack of alignment of current trade structures with DASR-66 license requirements which results in a MAML being issued with many Exclusions. There is nothing inherently 'wrong' with this as we note that CASA is also considering a CASR Part 66 modular licencing framework[61] that will allow for licences to be granted with limited scope (hence many Exclusions). This will enable licencing along the traditional civil General Aviation trade groups of 'airframes', 'engines', 'electrical', 'instruments' and 'radios' – but this approach requires closer workforce management. **We observe** that Army already recognises benefits from the 'electrical' overlap in the Cat-B1/B2 workforces and is pivoting training and workforce structure accordingly. We also note some RAAF SENGOs expressed a desire for a similar workforce. If Part 66 reflects an effective-efficient demarcation balance between trades, then lack of alignment must be at the expense of the 'effectiveness-efficiency' balance. This imbalance is particularly evident in the ARMTECH workforce that do not have a core B1 or B2 licence upon which their armament military maintenance endorsements are based. This adds to management challenges. The imbalance is also reflected in the unique 'interim Military Maintenance Authority' (iMMA) pseudo-licence that underpins an ASTTECH authorisation to issue a CRS – resulting from the B1 workforce having a 'minor structures' Exclusion or lack of the 'major structural repair' Inclusion.

108.   Some earlier DGTA Research papers mentioned in Part 1 above examined potential impacts of trade structure mis-alignment. Importantly, benefits from improved alignment and action to address the training gap were discussed in considerable detail in an excellent paper titled *'Discussion Paper – Optimal Work-scope of ATECH, AVTECH and ASTTECH Workforce'*[62] (dated Jul 20). The introduction records…

> The **purpose of this paper** is to **determine the optimal work scope of the Air Force** Aircraft Technician **(ATECH)**, Aircraft Structural Technician **(ASTTECH)** and the Avionics Technician **(AVTECH) trade groups.** This determination will consider alignment with DASR Part 66 as well as the impact of technology and Air Force strategic intent. The **overarching goal is to improve maintenance productivity and thus capability**. [**RT emphasis**]

109.   The paper examines current IET and work-scope of these three core Air Force aviation trades, identifies Exclusions that need to be applied to Licenses, and provides recommendations on three options for expanded training and work scope. These options are referred to as 'Light, Medium, Heavy'. The paper summarises with the following comments:

> Continued pressure on workforce numbers, the strategic desire for a more agile and flexible workforce, changes in technology support and the benefits of greater alignment with civil aviation maintenance structures require a further review. One of the mechanisms to improve maintenance agility and productivity is to increase cross trade employment, as identified under MPIP. The implementation of DASR 66 has highlighted the complexity and constraints created by our lack of alignment with the civilian licensing system and provide the impetus to take action now. Such action will also simplify

---

[61] CASA Discussion Paper DP 2218MS of Dec 22, BP35472924. – further details at para 181.
[62] 200710 -Discussion Paper -Optimal alignment ATECH_AVTECH_ASTTECH work-scope with DASR66, BP35472977.

maintenance planning. ***This paper demonstrates that maintenance productivity and workforce flexibility can be improved by expanding the work scope of ATECHs and ASTTECHs.*** *The paper* ***also demonstrates that the AVTECH work scope is already optimally aligned with DASR 66.*** **[RT emphasis]**

110.   **We observe** and applaud this effort to optimise workforce but are disappointed with the lack of follow-up. We note extensive discussion in a number of emails, Briefs, including AFCC Agenda papers[63], in recent years, including a more recent AFCC paper[64] with some useful staff comments. We note action agreed by DACAUST[65] (dated 1 Nov 22) to close an AFCC Action Item on this topic with planned action being…

> *A9-DMA, LOGBR-AF, DASA and FEG DLC's will continue to pursue potential efficiencies of the DASR 66 alignment concept through a holistic review so that interdependences and impacts and can identified and managed, and wider system efficiencies achieved.*

111.   We note subsequent plans by HQAC-A9 to undertake a further *'Critical Review of Maintenance Workforce Modelling'*[66]*,* with KPMG support. We look forward to this activity providing some actionable progress in the near-term on this important topic to recover development of efforts to better align Air Force's aviation technical workforce.

112.   To summarise, when initially exploring this topic, we were cautioned by DEM-AF against investing too much effort and providing recommendations on this topic (which we acknowledge with appreciation) as this is largely 'outside our swim-lane'. Nevertheless, we strongly believe that alignment of trade structures to the DASR-66 work scopes will enhance the trades. Operating to old workforce structures in a new licensing system will always remain suboptimal. Noting the significant ongoing impact of Air Force trade misalignment on the efficient and effective implementation of DASR-66/147, **we strongly recommend** further priority action by AFHQ and HQAC staff to address current trade structure, training, and DASR-66/147 alignment issues.

113.   Separately, **we observe** that Army and Navy are more advanced than Air Force and are operating with a degree of relative maturity that is focused on improving capability. Hence the recommendation above is focused on further action required within Air Force. In making this observation, we acknowledge the greater inertia and complexity faced by Air Force relative to Navy and Army, refer para 225.

DASR-66 Licenses for Specialist Trades– ARMTECH and ASTTECHs

114.   A significant topic raised in all Air Force focus groups related to management and applicability of DASR-66 licenses to the ASTTECH and ARMTECH trades. The potential to better align ASTTECH trade training to DASR-66 requirements has been explored in a research paper back in 2020 and addressed in limited discussion above (paras 22-24 and 64-68) related to ATECH/ AVTECH trades). Although we note further action is being separately pursued by AFHQ and HQAC-A9 (hence somewhat 'outside our swim-lane'), we see value in providing some limited comment from focus group feedback on potential pathways on each of these trades.

---

[63] 210423 -AFCC Agenda Paper -DASR-66 Alignment of Aviation TechTrades, BP35472933; 210723 -AFCC Agenda Paper -DASR-66 Alignment of Licenced TechTrades, BP35472988; 211015 -AFCC Agenda Paper -DASR-66 Alignment of TechTrades-Risk Perspective, BP35472963; and, 211015 -AFCC Agenda Paper -Technical Trades Advancement Plan - Annual Update, BP35472968.
[64] 211019 -AFCC (post mtg) DASR66 Update -Lamont LTCOL-Yurkowski WGCDR, BP35472964.
[65] 221101 -Brief DACAUST-DASR66 Alignment for TechTrades -AFCC Action Item, BP35472994.
[66] 230714 -Response to 'Brief for DACAUST-DASR66 Alignment...' on 1Nov22 –Status, BP35472960.

Scope of DASR-66 Licenses for ARMTECH trade

115.   Following discussion in the RAAF AMB focus group where some varying views from RAAF and Industry were presented, we requested a considered written response to capture key points raised. 82WG provided what we consider to be a good summary of key issues impacting the ARMTECH workforce and a potential pathway for resolution[67]. This was presented by SENGO 1SQN in the format of 'Problem-Impact-Solution' and is paraphrased below.

Problem

- *ARMTECHs don't fit neatly into the B1/B2 construct due to the specialist nature of the systems they work on; the current regime assigns ARMTECHs a B1.1 licence with heavy restrictions.*
- *Determining what is/isn't within scope is not a simple process and requires cross-referencing several documents including the DASR 66 MAML Exclusion-Inclusion-Endorsement Manual, the S1000D SNS Codes, DASR 66, and the subject MAML. This is further complicated by the fact that some military platform technical publications (eg, the F/A-18) are not neatly aligned with the S1000D SNS codes.*
- *The confusion around ARMTECH MAML requirements is also creating churn within our 147-organisation due to not having a clear/agreed training continuum between IET and Type training.*

Impact

- *As ARMTECHs don't neatly fit in to the B1/B2 construct there is significant confusion regarding what is within the scope of ARMTECH MAML privileges.*
- *This confusion could result in ARMTECHs either issuing a CRS for maintenance outside of their scope, or having another MAML holder (eg, B2) issue a CRS over their work which would introduce inefficiencies.*

Solution

- *The general consensus is that ARMTECHs are getting the training they need across IETs and type training to do their job safely (as evidenced by the lack of ASRs relating to ARMTECH technical deficiencies) so additional training is an undesirable outcome. Rather, better mapping and clearer identification of MAML scope is required to ensure their MAMLs appropriately cover the work we are asking them to do. Understanding Type training requirements with reference to IET training is difficult – and remains extant.*
- *There should be enough flexibility within the B1/2 framework using Exclusions/Inclusions to **not need** a separate MAML category (eg, B3). Note, it was acknowledged that training ARMTECHs to the full B1/2 would solve the problem; however, as detailed above, additional training is not recommended nor considered practical.*
- *Another option worth investigating could be to treat ARMTECHs as 'specialist staff' with the need for a licence. …although another dissenting-view states: 'Not appropriate as 'specialist staff' require a MAML holder to issue CRS'.*

116.   Boeing Defence Australia (BDA) also provided an Industry perspective on ARMTECHs[68]. The comments inserted below reflect similar feedback from all Air Force FEGs:

- *BDA has found the current Extensions have caused confusion amongst the trades workforce, in particular the Armament trade. Given the background and current mix of training amongst*

---

[67] 230703 Hardman covering Duke, Bacon and Fallows - ARMTECH DASR 66 issues - 82WG summary, BP34087338. This included dissenting views heard during focus groups on the electrical/avionics vs aero-mechanical training need, and some self-help review of the IET-Type training continuum -refer 230630 Fallows -ARMTECH DASR 66 issues - 82WG summary, BP34087350.
[68] 230706 -EMail BDA (Reibel) -Feedback AMB visit, BP35472916.

the ARMTECH workforce, MAML scope is very unclear. It is common for ARMTECH to have mixed B1 / B2 scope (or both) and multiple extensions for both B1 and/or B2 scope.

- *In the FA-18F and EA-18G context, the Armament workforce is often blurred between B1 and B2 scope, adding the extensions has compounded the issue.*
- *After reviewing the training package delivered to 82WG FA-18 ARMTECHs, BDA believe that the ARMTECH course is more a systems course (not a Type course).*
- *Argument could be made that the ARMTECH trade do not align to either a B1 or a B2 MAML (although closest to a B2). ARMTECH do carry out work that warrants CRS, in particular safety systems.*
- *Consideration should be made to assigning a separate MAML category to ARMTECHs to ensure task coverage and remove confusion regarding B1 or B2 alignment. Or potential utilization of Armament trades as a 'specialist service'. (**RT comment**: we note this comment clearly conflicts with the SENGO bullet above but is included to show the diversity of views on this topic. Nevertheless, we do **not** support a 'Specialist' license approach – further comment in para 122 below).*
- *As a general observation, **the fact that we have people with significant training and organizational governance experience** (including Defence units) **are unclear on this subject means the workforce has next to no chance of working effectively** to the guidance. This **potentially represents a risk to airworthiness** as it is probable that an ARMTECH (and to some degree across all trades) could issue a CRS out of scope.* **[RT emphasis]**

117.   We observe that ARMTECHs come from a variety of backgrounds that will result in the workforce holding either Cat-B1 or Cat-B2 licences – the nuance being the inability to conduct extensive electrical fault finding and the inability to maintain hydraulic-mechanical system on respective licences. The important requirement is that an ARMTECH weapons system education provides the ability to conduct advanced fault finding on armament systems composed of aeromechanical, avionics and explosive ordnance technologies. Hence, irrespective of the Cat-B1/B2 licence held, ARMTECHs should be able to complete TSO and CRS on armament systems on which they are qualified. DASA advised that they would consider pragmatic modifications to DASR for ARMTECH MAML privileges when backed up with appropriate training and inclusions on the MAML. Accordingly, __we recommend__ that AFHQ (LOGBR), in conjunction with DASA, develop a licensing education package specific to ARMTECH trade scope and authorisation and be delivered during IET so that ARMTECH understand the privileges of their Licence, also that this package be provided for subsequent continuing professional development (refresher training) at Units.

Scope of DASR-66 Licenses for ASTTECH trade

118.   We received strong focus group feedback during both RAAF AMB /WLM visits on the impact of DASR-66 on ASTTECHs. Again, we requested a considered written response to capture key issues. The following response was provided by an ACG WOFF[69] and captures key issues and sentiments raised in discussion very well, although it contains a key misunderstanding of CRS, as underlined and specifically addressed below).

While the problem of ensuring adequate personnel to fill positions may fall with DP-AF, one oft-quoted reason resulting in ASTTECH dissatisfaction, and contributing to their departure from RAAF is DASR-66 ('The bucket will never fill if you don't plug the holes'). Personnel who previously worked under TAREGs feel they are not valued to the same extent as their AT, AV, AR counterparts due to previously being able to certify for their own work, whereas now can only do so under the temporary measure of iMMA. The temporary measure, in itself, has been an

---

[69] 230726 -Email -ACG - 3SQN -Issues (incl Lateral Transfer), BP35472926.

improvement over previous requirements of having an ATECH B1 apply CRS, as ASTTECHs felt subordinate to other trades (and still do). This initial requirement left personnel questioning where the RAAF and DASA stood regarding who were the technical masters of their trade. Furthermore, the CRS attestation by certifying staff includes the identification that the task has been <u>carried out to the required standard</u>. While the task may have been carried out IAW OIP, the underpinning knowledge, skills and experience is often absent from an ATECH B1, thus there remains the question of <u>how can the certifier have less proficiency in the task than the tradesperson</u>?

Like all enlisted personnel, ASTTECHs are passionate about their craft, their trade. They are a significant piece in F-35A maintenance and due to corrosion and Low Observable tasking, they are the resource we very much rely on. F-35A will fail if ASTTECH workforce health further deteriorates.

If DASR 66 is to remain we must allow them to certify for their own work, potentially through a B1 with exclusions. We utilise our ASTTECHs in a different way to our civilian airline friends who have a focus of Structural work in Base Maintenance. We use ours in Line Maintenance every day and if DASA were to return to having ATECH B1s to certify for ASTTECH tasks, this would be an inefficient maintenance practice and will result in further ASTTECH transitions from RAAF.

The <u>underlined</u> words above reflect a misunderstanding (as already addressed above in our second major Part 2 theme, at paras 41-45) which we have included as another example highlighting the need for more education and a wider narrative on the nexus between 'supervision' and 'certification'. Specifically, Certifying staff do not necessarily need to task **supervise** maintenance themselves (they can have other authorised supervisors do this for them) in order to **verify** that maintenance has been properly carried out. This is especially the case for specialist tasks where it is normal and expected for the Certifying staff to have less proficiency in the task than the tradesperson.

119.   We note that the interim arrangement approved by DASA via *AC 01-2021 Certification of On-Aircraft Structural Repairs -Interim Arrangements* which provides ASTTECHs with an interim Military Maintenance Authority (iMMA) is due to expire on 31 Dec 23 – leading to the concerns expressed above. The need for iMMA arises from a gap between legacy training and DASR-66 MAML requirements. This gap in the B1 License only applies to Air Force and Army technicians - not Navy as they already complete training for certification of on-aircraft structural repairs during IET. We note recent DASA-DCA staff activity which is examining future options. This includes continuation of the current iMMA approach but under a different instrument where risk is documented and retained by the Operational Commander. We support and **<u>recommend</u>** extension of the iMMA approach for ASTTECHs beyond 31 Dec 23 along these lines until a mature solution[70] can be developed.

120.   While we agree that this option represents a pragmatic capability-focused solution with appropriate risk management and retention, **we believe that such an approach requires a broader narrative and detail of a strategy to achieve a long-term solution** that fully recognises the value and depth of specialist knowledge, skills and work value currently provided by the ASTTECH trade. This includes the value-add of the previous Trade Supervisor (TS) role and the TS certification but now only 'task sign-off' (TSO) level. This TS role for specialist trades has largely been lost under DASR-145/66. In turn, this TS role has been replaced by a strong focus on the second signature (TS under TAREGs) now being a CRS which can only be issued by a B-MAML holder (who may have a wider aircraft systems knowledge but that breadth of knowledge is dependent on MAML Exclusions). Under DASR-66, DASA do not consider that ASTTECHs have sufficient Basic Knowledge as reflected in UOCs to justify issuing a

---

[70] The mature solution, during Air Force consideration of the recommendation made at para 109, could include removing structural repair exclusions from existing (and future) ATECH B1.1 MAML holders to enable a flexible and agile structural repair capability.

License (ie MAML). We note that responsibility for creating and providing this broader narrative extends beyond the remit of DASA and includes AFHQ-DGLOG and HQAC-A9. While potentially extending beyond our TORs, given the considerable feedback provided during our focus groups along with expectations for a solution, we consider it appropriate to provide some thoughts on this topic. Some RT thoughts and recommendations follow.

121. As noted earlier (paras 107-113), considerable effort has been invested in past examination of options (including AFCC papers) to better align ATECH/ASTTECH trade structures with DASR-66 B1 license requirements. The originating Discussion Paper (see paras 108-109) examined three options (Light/Medium/ Heavy) for additional training delivered via RAAFSTT. For ASTTECHs, the paper recommended the Light option. However, the resource cost was still considerable and appears to have influenced possible adoption.

122. Instead, we propose an alternate option - which focuses on creating a post-IET pathway for ASTTECHs to achieve a Cat-B1 license (with some Exclusions). This would be achieved using a 'DASR-66 modules and examination' pathway plus Unit experience. This approach would not use the MEA delivered by training at RAAFSTT, instead training would be undertaken by correspondence (self-paced) supported by work-place experience. The advantage is an end-state with an ASTTECH workforce who are progressively able to perform maintenance activity beyond their current ASTTECH work-scope and focusing on performing often essential parts of their structural repair maintenance task in getting access to repair sites (eg, the removal/ installation of aero/hydro-mechanical and electrical system components). With this work-scope expansion, an ASTTECH could undertake some similar maintenance activity, but generally as part of structural repair tasks, to a Cat-B1 ATECH. This extra training would provide a training pathway, with a low-capability impact, to allow self-paced training to expand aircraft systems knowledge and, after gaining experience, ultimately resulting in added privileges as a Cat-B1 MAML holder. A further motivator could be eligibility for a potential Skill Grade (SG) upgrade and associated pay rise. To assess the duration of correspondence training, some mapping is required to identify the gap between current IET and DASR-66 requirements – to recognize knowledge gained from MEA and filling gaps by correspondence course and examination.

123. Accordingly, **we recommend** that AFHQ-LOGBR consider initiating a Training Needs Analysis (TNA) to examine the most feasible training model to provide a post-IET (P-IET) pathway for ASTTECHs to achieve a partial Cat-B1 License. We expect that different FEGs will have different expectations from their ASTTECH workforce given the varying structural repair work required on local aircraft fleets. As a result, this approach would give Commanders greater flexibility to empower and customize their technical workforces, including the composition of local / deployed work teams including ASTTECHs with the required MAML privileges to support operations.

124. **We observe** that the above focus on creation of a P-IET pathway for ASTTECHs could be equally useful for other trades and allow IET to focus on the 'performance of maintenance' (with TSO), and P-IET to focus on obtaining a MAML. P-IET could involve DASR-66 module knowledge and experience assessment conducted without the member having to leave their posted location, ie completion of experience record and local examination. As noted above (para 120), we recognize this requires wider consideration of other impacts by AFHQ and HQAC-A9. Nevertheless, given the potential for value-add, **we recommend** that DASA provide written guidance on how a MAML could be obtained via a DASR-66 module knowledge and experience assessment approach. In effect, this aims to achieve a combination of the two learning systems - some Basic Knowledge attained with MEA issued by a RTO, and other Part 66 Modules attained from a self-study and examination pathway (such as provided by CASA) whilst gaining experience on military aircraft.

125.   **Specialist DASR-66 Licenses.** We received varying feedback on the topic of a Specialist MAML for ARMTECHs and possibly ASTTECHs. We note previous DASA advice that this option has been previously considered and rejected as *'DASR-145 already provides an authorisation process for all Specialist Services including NDT, major structural repairs, surface finishing, etc[71]'*. On balance, we agree with this approach and look forward to DASA issuing a Factsheet on requirements for authorising 'Specialist Services' similar to the long-standing Draft CASA Factsheet already prepared to remove future confusion.

MAML Supervision Exclusion (E62) removal – An Industry Issue

126.   All ADF Cat-B MAML holders have an E62 'Excluding Supervision of maintenance' when their licence is first issued[72]. This results from a Service decision to defer this training until 'time of need'. This training is subsequently delivered through Skill Grade 3 (SG3) training - via the RAAF's Aviation Technical Supervision Course (ATSC); the RAN's Leading Seaman-Advanced Troubleshooting course, and the Army's RAEME Subject 4 Corporal course - followed by an assessment from the subsequent 'Board' process used by each Service. DASA recognises the SG3 training pathway for removing the E62 exclusion. The exclusion has no detrimental effect on Air Force, Army or Navy maintainers. Instead, it is an accurate reflection of an individual's career development.

127.   Feedback from some Industry maintenance organisations reported considerable challenges for some licence holders to remove the E62 exclusion from some licence holders, citing both significant cost and time. For Defence Industry staff, civilian licence holders who have completed relevant Australian Units of Competency[73] as part of their LAME education will also satisfy the required DASR-66 modules. However, the MAML E62 exclusion can only be removed after completing DASR Module 10 training (for the new DASR working environment). The SG3 and MEA pathways to remove a E62 exclusion is defined in DASA's *'Military Aircraft Maintenance Licences Exclusions, Inclusions and Endorsement Manual'*. The workforce impacted are a legacy from the TAREG/DASR transition following cessation of DEF(AUST) 9022 based on the very limited career development profile it required. Three pathways exist for these maintainers to achieve the education needed:

   a.   Complete the necessary DASR Part 66 modules,
   b.   Complete the Australian Units of Competency, or
   c.   Complete a SG3 course.

128.   Of the three SG3 courses available, the RAAF's Aviation Technical Supervision Course (ATSC) has the shortest training day duration[74], and hence represents the least burdensome way for Defence Industry to remove an E62 exclusion. Nevertheless, **we recommend** that Air Command consider options (with ATSC attendance being one option) to support Defence Industry MOs (that maintain ADF aircraft) to remove E62 Exclusions as an efficiency and productivity measure. This also includes Industry MOs supporting RAN-FAA and Army Aviation.

---

[71] 230530 -MAML -'SPECIALIST' Licences -Email Crowe-Galea, BP35483500. CASA Maintenance Personnel Licensing advised on Oct 23 that there are no plans to issue this Advisory Circular at this time.

[72] This exclusion is not relevant to a Cat-A licence holder because they are not allowed to issue a CRS for other maintainer's work, hence no 'supervision' of other's work.

[73] When Australian Units of Competency MEAs 111, 112, 113, 116, 142 and MSMENV472 are completed as part of LAME education, they will satisfy DASR-66 Appendix 1 Modules 7.19, 7.2, 9.1-9.9 inclusive, and 10.1-10.7 inclusive, see 211112 - Email Galea-FW_ E62 Exclusion, BP35505725.

[74] RAAF ATSC, 5 days; RAN Leading Seaman- Advanced Technical Training (LS-ATT) course, 12 days; and, Army Subject 4 Corporal course 23-24 days.

Feedback from large Maintenance Research Project Survey

129.   Following our focus group discussions at RAAF WLM with ACG and SCG staff, we were offered a copy of Undergrad Research paper completed by FltLt (ex-FSgt) Fitzgibbon as part of a Griffith University project during 2022. The aim of the paper was:

> '…to capture the impact of the transition to MAML from TAREG and its implementation on efficient maintenance practices along with its benefits or withholdings to ADF aviation maintenance. This is to understand if there is an issue with the regulations, with DASA training packages explaining the regulations, the FEGs interpretation of DASR or the military culture in accepting the new framework.'

130.   We found some sections of this paper relevant to our review. Of particular interest, the project included a survey[75] that had been forwarded to maintenance staff in Air Force FEGs employing RAAF technicians (ie ACG, AMG and SRG) and targeting junior ranks most impacted by introduction of MAMLs. Over 130 responses were received showing a good balance across the three FEGs, with around 30% being SGT to WOFF and the remaining 70% CPL rank and below.

131.   While we recognise the need for caution in interpreting unfiltered comments from a non-scientifically prepared survey, we found questions clearly expressed and well targeted. The level of detail in, and the tone of responses varied but were generally very interesting, illuminating in some areas and consistent with focus group feedback, albeit often from more senior staff. Responses also provided some extra granularity in describing an Air Force aviation technician training and employment system with a degree of dysfunction and disconnection. We have included a representative selection of some notable comments in **Annex D** which record a range of unfiltered comments received during our review.

132.   Given the primary focus being on the impact of DASR-66 maintenance licensing (ie, MAMLs) on technicians and their direct supervisors, we consider that some of the survey responses merit further examination that goes beyond our TORs and topics already covered in this report. Hence **we recommend** review of FltLt Fitzgibbon's survey responses by DASA-DCA staff to aid understanding, context and impact of some specific DASR-145/66 implementation issues, recognising that some may already have been subject to updates. The covering Research project report[76] is available for optional reading if desired.

133.   As noted above, some survey responses extend beyond DASR-66 implementation (ie, topics for DASA consideration) to broader technician training and employment issues under DASRs and extend beyond our TORs. Hence **we recommend** relevant AFHQ-LOGBR and HQAC staff also review survey responses to aid understanding, context and impact of concerns on some specific issues, particularly IET, P-IET, alignment of trade structures, employment practices and remuneration issues. Incidentally, the question arises whether these issues have previously been raised for management attention in other surveys, including periodic DFSB surveys or 'Safety Snapshot'. DFSB staff may wish to consider whether there is any overlap in survey target areas or themes in responses.

Potential influence of DASR-66 on Technician Remuneration

134.   A topic raised in some focus groups was the impact that DASR-66 has had on technician remuneration - particularly at the junior LAC/W technician level. Hence, we considered it appropriate to include some short comment on this topic. We note that back in 2008, the DFRT established a tri-service system of pay grades and employment categories for enlisted ADF members known as GORPS. At the time, promotion to Corporal was time-based and Air Force

---

[75] 230804 -Aviation Research Project-Impact of DASR66 Licensing -FltLt Fitzgibbon-SURVEY, BP35472947.
[76] 230804 -Aviation Research Project-Impact of DASR66 Licensing -FltLt Fitzgibbon -Aug22, BP35473001.

had identified supervisory activity as being restricted to the rank of Corporal and above. As such there was no specific provision for LAC/Ws to be regraded to Supervisor (SPVR) Skill Grade (SG).

135.   Since GORPS, the maintenance workforce has evolved significantly with the reintroduction of merit-based promotion to CPL, MPIP and other organisational policy changes. The outcome is that LAC/Ws are now routinely being authorised and directed to undertake technical supervisory duties to meet capability outcomes. We note that this change was addressed in a submission to the DFRT with a formal ruling accepting the change provided in Dec 22. This DFRT outcome was widely communicated in a 'DGPERS Message[77]' (dated 16 Dec 22) that provided full details of the decision and criteria for awarding of the Supervisor (SPVR) Skill Grade to LAC/Ws as from 22 Dec 22. Hence this remuneration issue for LAC/W added supervision levels has now been resolved.

136.   Possession of MAML is clearly a very important hallmark for the AC/W, LAC/W and CPL community. However, possession of a MAML is less important for the SGT/FSGT community in discharging their technical leadership responsibilities. **We observe** that remuneration for supervision (as distinct from certification) in these ranks is independent of MAML possession. Although the LAC/W supervisor pay case took considerable time to reach an outcome, we see the system is functioning, hence have no further comment or recommendation on this topic.

DASR-66 Implementation in Navy, Army and Industry

137.   This report has already highlighted many issues for Air Force to address to improve DASR-66 implementation outcomes. These include workforce trade alignment, DASR-66 optimisation, FEG and AFCAMAN best practice and knowledge sharing. Although most issues also apply to Navy, Army and Industry, they are ahead of Air Force in some areas. At transition to DASR-66, **Navy** was in a fortuitous position of having their two aviation trades already closely aligned to the intent of DASR. Since DASR-66 transition, **Army** has already invested considerable management effort, time and funds to transform their training and work force structure. Also, **Industry** has largely transformed their workforce with the exception of issues related to their legacy workforce. Further detail on progress, along with some differences with their approach to DASR-66 transition and also specific issues raised follow.

DASR-66 Implementation in Navy (Fleet Air Arm)

138.   Prior to our focus group meeting with Fleet Air Arm (FAA) on 19 Jul 23, we had examined some RAN documents[78] which showed that the authors had a sound grasp of licencing choices and application in the maintenance environment – demonstrating 'the art of the possible'. Discussions in our focus group confirmed Navy's maturity in understanding and applying DASR-66 and 147 to achieve an effective outcome in their DASR-145 maintenance organisation and operating environment. Our examination of key Instructions (ie, 'Standing Instructions – Naval Aviation') related to DASR-145 personnel authorisation[79], roles and responsibilities[80], licencing and use of TSO and CRS[81] found the documents to be well written and coherent. The CAM advised that they were considering further improvements to 'FAA Part 145 Maintenance Core Definitions'.

---

[77] 221216 -DFRT LACW Supervisor Pay Case -DGPERS Update, BP35472985.
[78] 211116 Service Brief - AT Workforce Review - Final Version - 16 November 21, BP35472958; and, 221130 - Service Brief - What should the flight maintenance construct be, BP35484587.
[79] SI(NA) ADMIN 2-02-07 -Maintenance Authorisations, BP35472929.
[80] SI(NA) LOG 3-06-01 -PPSI Maintenance within Naval Aviation. BP35472918.
[81] SI(NA) LOG 3-06-07 -Maintenance Certification +Certificate of Release to Service, BP35472974.

139.   In subsequent correspondence[82], FAA advised that Navy's 'Conduct of Maintenance' SI suite underwent a significant re-write following the FAA-CAMO audit by DASA in Mar 23 which resulted in six Level two findings. Specifically, three Level two findings were raised to address FAA's incorrect understanding of 'DASR 66 – Military Aircraft Maintenance Licensing'. Navy's response was to establish clear direction for maintainers which included defining three key maintenance functions - these being Task Sign-Off (**TSO**), **Verification** and **Certification**. **We observe** these changes as adding clarity to the narrative that Navy has already developed in adapting previous maintenance terminology and workforce team structures to align with DASR-145/66 requirements and can contribute to a better explanation of the nexus between 'supervision' and 'certification' (refer paras 41-45). FAA advised a contributing factor to their incorrect understanding of DASR-66, ie 'not being fully aware of Category A MAMLs restrictions', was the relative obscurity of references to MAML Exclusions within DASR-66, lack of a link to the *MAML Exclusion, Inclusion and Endorsement Manual*, and the need for an understanding of S1000D codes to interpret a Licence's Exclusions/Inclusions. The circumstances may have been unique to Navy at that time because of long experience operating only as Base Maintenance, also lack of familiarity in managing Exclusions as their training system results in relatively few Exclusions against their Cat-B Licence holders. Also, they had slowly drifted over 18 months into a situation where they '*introduced the condition for Category A MAML holders to issue CRS outside the bounds of their certifying privileges and outside of the scope of specific task training within the IET and EAC*'. **We observe** that these diversions may have been prevented by better collective education and CAM meeting forums to discuss such matters.

140.   We also requested detail on FAAs IET training that has now transferred to Nowra. FAA advised:

> *IET for AT sailors has been established at Air Affairs Australia Nowra, 5.3 Km from HMAS Albatross.* **The advantages that Air Affairs training affords over IET at RAAF Wagga,** *are reduced time frames for IET/ EAC completion, and contemporary training on in-service systems. … blending IET and EAC allows for topics of theory conducted at Air Affairs and the practical EAC component at TA-AVN to be packaged and delivered as a block. Blocks are planned for as a training package, expediting journal completion and issuance of the Category A MAML.* **This system reduces the training time on average up to 5 months.**
>
> **FAA have the ability to control/ influence the training system.** *For example, Air Affairs are piloting a course that removes some electrical exclusions within Category B1.3 MAMLs. Although this training increases the time frame by 3 months, the additional MEA delivery will remove exclusions and increase the versatility of the Category B1.3 MAML Holder.* **Post a trial period, the FAA will assess the advantages realised** *and if the FAA wish to continue training Category B1.3 MAML Holder to this level.* **[RT emphasis]**

Accordingly, **we observe** the value achieved in having effective control of a training system of and compliant training devices which has allowed Navy to realise both increased efficiency (two months less time in training) and effectiveness (electrical skills for the Aircraft trade group) in training delivery.

141.   Two specific issues were raised during the focus group with a request for follow-up action, these being:

a.   Improvement in CAMM2 and/or CAMM2 business processes, to improve consistent use of language and functionality for issuing of CRS (addressed in para 38), and

b.   Pathways for Defence Industry to remove E62 Exclusions (addressed in para 127).

---

[82] 231018 -Charalambous -FAA Report to Senior Exec Review -MAMLs and DASR-147, BP36667375.

DASR-66 Implementation in Army (Aviation Command)

142.   Prior to our focus group meeting with Army's Aviation Command (AVNCOMD) on 22May23, we had the opportunity to examine an extensive range of detailed documents, including 16 Aviation Brigade Standing Instructions[83] related to their DASR-145 personnel authorisation, roles, responsibilities, licencing and use of TSO and CRS. All documents were well written and coherent. A copy was also provided of the Army CAM's response[84] to a number of thoughtful and probing questions from RNZAF staff seeking details on challenges with implementing Part 66 – these questions closely aligned with our Review's TORs. This response, combined with details of Army's plans, business cases, analysis and progress reports provided clarity and confidence in Army's approach to implementation. Some key points on workforce changes underway follow:

   a.   Two years into a program of exclusion removal against junior NCO B1.3 Licence holders, service is contracted from Aviation Australia.

   b.   Two years into a trial of IET of ECN-411 (ATECHs) and ECN-412 (AVTECHs) aligned respectively to DASR B1.3 and B2 licenses, acknowledging good support being provided by AFTG and BAES at RAAFSTT.

   c.   Two years (three cohorts) of creating Aviation Technical Specialists holding B1.3 and B2 Licences, for up to 10% of the workforce, with positive feedback from the members, SENGO and COs.

   d.   Use of an ECN 034 SERCAT7 Gap Year from FY24/25 with pathways to ECN 411 and ECN 412 and SERCAT5.

143.   Two specific issues were raised by Army with a request for further action and resolution, these being:

   a.   Require ASTTECH iMMA after 31 Dec 23 until a critical mass of B1.3 (without the minor structural repair exclusion) is achieved. Note that this is Army's planned solution, whereas RAAF does not have a solution that replaces the need for an iMMA longer-term (refer para 119).

   b.   Although a RPL process against Cert-IV Units of Competency exists, an RPL process against DASR-66 Modules is required to assist the assessment of foreign trained maintainers. Army Aviation Training Centre (AAvnTC) is pursuing this initiative but is limited by resourcing.

144.   Feedback from all three Services highlighted the need to maximise productivity of UK and US foreign trained maintainers that join the ADF or Defence Industry to optimise capability outcomes. This includes the ability for these maintainers to perform both TSO and CRS where a potential process exists to support this outcome. We consider that work initiated by Army (AAvnTC) to establish an RPL process against DASR 66 Modules has significant potential to benefit all Air Force, Navy and Industry employers – probably more so for Air Force who are struggling with DASR-aligned training. Accordingly, **we strongly recommend** that appropriate priority and resources be provided to AAvnTC to pursue this initiative to establish a RPL process against DASR-66 modules to achieve this worthwhile capability-enhancing activity.

---

[83] SI(BDE) LOG-07-102, BP35472934; LOG-07-103, BP35472953; LOG-07-104, BP35472894; LOG-07-201, BP35472903; and LOG-07-202, BP35472965.
[84] 230405 email Kurylewski/Baker [RNZAF] FW: Part 66 Implementation Lessons Learnt, BP35472962, with additional insight provided in 230323 email Howard/Porada FW Part 66 Implementation Lessons Learnt, BP35472900.

DASR-66 Implementation in Industry

145.   Defence Industry participation in several focus group fora was largely positive. Industry generally came across as agile and very capable of using DASR-66 to achieve their preferred DASR-145 construct, with a variety of Line and Base Maintenance approaches described. Interestingly, the only points of frustration and friction raised can be grouped under the following three themes:

   a.   Frustration over considerable MAML backlogs and long delays in receiving a response to questions on initial MAML backlogs, noting that the wide variety of backgrounds of mature personnel starting employment will usually require a case-by-case examination by DASA.

   b.   Armament technician training and development issues, leading to a strong preference by Industry to recruit ex-ADF ARMTFIT for their armament workforce.

   c.   The cost (both time and money) for legacy workforce technicians to undertake training at commercial CASR-147 training providers to remove an E62 supervision Exclusion. This is an example of waste in the Australian training system that is being borne by Defence Industry, by requiring a small group of Diploma-level MEAs that are not streamlined to Part-66 (addressed earlier in para 128).

Status and Maturity of DASR-147 Maintenance Training Organisations

Australian aviation sector education

146.   A number of reports that we examined indicated that the Australian aviation education system is in a rather entangled and sub-optimal state.   A paper providing some important insights is titled - 2018-19 *Case for Change - Alignment of VET qualification standards to CASA licensing regulations*[85] We have included several extracts below which describe some of the key issues:

> Aircraft maintenance licensing training is regulated by the Civil Aviation Safety Authority (CASA), under Civil Aviation Safety Regulations (CASR) Part 147, as well as by ASQA (the Australian Skills Quality Authority) which operate under different frameworks. **The lack of harmonisation** with the International Aviation Safety Assessment (IASA) standards **is costing the industry money and limits opportunities. The biggest issue is the current rigidity of the VET system to absorb** the Civil Aviation Safety Authority **(CASA)/**European Aviation Safety Agency **(EASA) regulations. The main difficulty is in trying to match the theoretical regulatory outcomes of CASA/EASA to the current vocational education competency-based model**. This project will investigate and develop a framework for qualifications for LAMEs that accommodates the CASA/EASA regulations and VET standards.
>
> **Attempts have been made to accommodate the two different frameworks into the current licence qualifications, adding much complexity, inconsistency with current VET standards and potential for interpretation** while at the same time **lacking the rigour required to provide assurance** to the aviation industry **that licence holders will have the necessary skills and knowledge to undertake the work required to ensure safety.**
>
> Aircraft maintenance licensing training is regulated by CASA (under CASR Part 147) as well as by ASQA (the Australian Skills Quality Authority) which operate under different frameworks. CASA operates under a knowledge and experience framework and ASQA operates under a competency framework.

---

[85]MEA-Aerospace-2018-19-VET-CASA-Harmonisation-marked up by RT, BP33508053.

From July 2020, CASA will no longer administer the licence examinations or set a central bank of questions, which will potentially set the scene for RTOs to set and use a wide variation in examinations and interpretation of assessment. CASA will issue the licence on the recommendation of an approved Part 147 organisation, rather than play a role in the assessment of competence, theoretical knowledge, or experience. Also, CASA will no longer use the assessment of competence, theoretical knowledge, or experience. Additionally, CASA will no longer use the Schedule of Experience to scrutinise a prospective licensee's records of their experience; this will fall to the RTO/MTO that may interpret competence for experience.

Without a new and radical approach to the entire Aeroskills Training Package to ensure alignment with the CASA/EASA standards and clear vocational outcomes:

- *the current disenfranchisement of the industry will grow as it meets its needs using alternative approaches, including sourcing workers from overseas;*
- *student enrolments and completions will decline;*
- *Australian industry will not be well positioned to capitalise on global growth forecasts; and*
- *Australia risks no longer being well regarded globally in the provision of aircraft maintenance engineering services.* **[RT emphasis]**

147.   We also examined a more recent paper from the Regional Aviation Association of Australia (RAAA)[86] (dated Oct 22). This submission strongly presents the views of Australian General Aviation AME community and offers seven recommendations for positive, pragmatic and value-adding reforms to resource the sector in the short- and long-term. One of these recommendations is relevant to Defence:

Align theory training delivery nationally & create a National Aviation Academy.

Currently, the states and territories control apprentice training and its funding, contributing to the disparity in training delivery. For example, the Northern Territory allows certain modules to be studied away from the trade school setting, whereas Western Australia does not.

*The Diploma in Aeroskills (mechanical) and (avionics) qualifications sit under the Australian Qualifications Framework (AQF) (ie, the vocational and educational training system), which in turn sits within the portfolio of the Department of Employment and Workplace Relations (DEWR). **To eliminate disparity in training, we recommend strongly that all MTOs deliver the theory training syllabus that is aligned with the CASR Part 66 Manual of Standards to assure academic consistency for all apprentices** [**RT emphasis**].*

We observe that the lack of optimal alignment of Australian MEAs with Part 66 Modules represents waste and undermines the capacity of the Australian education sector to meet aviation sector demand. Accordingly, **we recommend** that DASA, as the aviation Regulator for Defence and Defence Industry and thereby complimenting CASA in their role, take action to obtain permanent representation and voice at the national forum[87], provisionally called the 'Strategic

---

[86] 221001 RAAA Paper - Aircraft Maintenance Engineer Shortage - Crisis and Opportunities, BP35507073.

[87] Appendix 5: Jobs and Skills Councils | Australian Skills Quality Authority (ASQA) cites the Manufacturing Industry Skills Alliance as the jobs and skills council with oversight of the MEA Aeroskills training packages. MEA Aeroskills are not scheduled for action in the current Annual Training Product Development Plan 22/23 at Our work – Manufacturing Industry Skills Alliance (manufacturingalliance.org.au).
Chris Hudson advised on 230904 that a 'Strategic Industry Task Force' (name TBC) will be established this year (replacing the Aerospace Industry Reference Committee (IRC) chaired by Russell Burgess), with details to be provided in the website, to manage individual training packages using invited subject matter experts. If approved (and funded), the outstanding review of MEA Aeroskills could start in 2024. Previous IRC membership included CASA as the sole 'Government regulator' and Department of Defence as one of four 'Employer/Peak organisation/Association' alongside Qantas, AMROBA and RAAA. We recommend that DASA look to join CASA as the second 'Government regulator' specifically of the Defence aerospace sector.

Industry Task Force'. The Defence RTO (DRTO) will retain their representation as Defence's training representative and voice.

148. Prior to focusing on Defence's delivery of aviation training under DASR, we take a quick look below at one of several long-standing Industry Part 147 organisations at the National level which we consider provides a benchmark for delivery of aviation training under DASR.

149. **Aviation Australia Part-66 License support.** The RT met with CEO Aviation Australia (AvA) and staff on 24 May 23 to discuss local Australian aviation industry training capability. AvA is a nationally approved Registered Training Organisation (RTO) and also an approved Part 147 Maintenance Training Organisation (MTO) by the Civil Aviation Safety Authority (CASA), the European Aviation Safety Agency (EASA) and the General Civil Aviation Authority (GCAA). AvA is currently responsible for training and assessing over 95% of Australia's aircraft maintenance engineering (AME) apprentices across 200 maintenance, repair, and overhaul organisations. As an approved Part 147 MTO, AvA can provide Part 66 training and assessment for AMEs wishing to be licensed by CASA, EASA, GCAA[88] and DASA. Some key points from the discussion as recorded in a follow-up letter[89] (dated 1 Aug 23) are listed below:

a. Queensland Aerospace Schools Cert-II meets both VET requirements and it will meet Part 66 theory requirements for a Cat-A MAML by students completing the twelve Pt 66 Module examinations. A trial conducted with students sitting exams concurrent with school education produced poor results. Hence the preference is for students to sit exams after secondary school graduation.

b. Fast-track (theory and practice) Cert-II for a Cat-A MAML can be completed in 80 days.

c. EASA will never undertake RPL until it is resourced to do so, which is considered 'never'.

d. AvA estimated that it would take around three months to map an optimised Part 66 to VET MEAs, followed by verification of the tool to manage the assessment, for ASQA to sign-off on the map/tool - a total estimated schedule of around 12 months.

e. Australia should provide three pathways to attain a Part 66 License, these being:

   i. A 'Straight Part 66' per the recently created CASA[90] self-study training and examination pathway)

   ii. A Part 66 optimised for VET MEAs (refer above to the **unrealised** 2018-19 *Case for Change - Alignment of VET qualification standards to CASA licensing regulations*), and

   iii. The current VET MEAs **sub-optimised** for Part 66.

150. W**e recommend** that AFTG investigate the feasibility for a DASR-66 Module assessment system (Knowledge exams and Experience log-books) to support P-IET achievement of a MAML or Exclusion removal while continuing to work in posted location if the CASA self-study training and examination pathway is determined to be unsatisfactory for Defence needs.

Defence Air Domain MTO

151. Following DASA's introduction of DASR-147 in October 2017, we note records of considerable discussion and papers examining options, including organisational, on how best to implement the new Regulation[91]. We note agreement between DASA and AFTG in late 2018 for

---

[88] General Civil Aviation Authority.
[89] 230804 Aviation Australia's response to DASA Review of Part 66 Licensing and Training, BP24792193.
[90] Part 66 self-study training and examination pathway | Civil Aviation Safety Authority (casa.gov.au).
[91] 170822 Brief for OC GTW Defence Aviation Safety Regulation – Overview and Current Implementation Considerations, BP36938452. 171116 Brief for DETB - Defence Aviation Safety Regulation of Aircraft Maintenance Training Organisations BP35507051. 171215 DETB 03_17 Meeting Outcomes_Annex B Summary of

the creation of the single Air Domain MTO that leverages extant HQAFTG RTO capability[92]. This was followed in early 2019 with agreement on the roles and responsibilities of the new DoSA (Training) appointment within AFTG[93]. However, despite this apparent progress, in Nov20, a DASA paper summarising the agreed DASA and HQ AFTG position for a single DASR-147 Air Domain MTO records the following statement: …*'CDR AFTG has raised concerns with the implementation of the Air Domain construct and has indicated he will be seeking Air Command and DETB agreement for an alternative model, as he is not confident the current arrangements are appropriate or actionable.'*[94]

152.   We received feedback during FEG focus groups highlighting a number of MTO concerns. These included a lack of maturity in processes, understanding and experience within the Air Domain MTO, a lack of integration of long-established RTO practices into a 'system of doing business', and also concern that the window for transition or 'grandfathering' of Military Aircraft Type Rating (MATR) training that is provided by FEG's to DASR 66 requirements had closed with effect 30 Jun 23[95]. This latter action followed DASA's notification of intent that MATR courses still non-compliant with Appendix 3 to DASR 66 will no longer be recognised after 30 Jun 23 as an acceptable means to attain a MATR endorsement. Feedback also indicated that the ADF was lagging Industry with its implementation of Part 147 MTOs[96]

153.   An RT focus group meeting with CDR AFTG and staff on 19-20 Sep 23 discussed a range of issues including the maturity of ADF's DASR-147 MTO and their role in delivering IET training at RAAFSTT, oversight of Type Training in FEGs, and activity of the DoSA (Training). Discussion confirmed that there was still a gap between 'expectations and reality' with DASR-147 implementation - per the following comments:

> *'**A fundamental assumption during introduction of DASR-147 was that RTO covered IET and P-IET equally well** with a high granularity of training requirements **but,** while the RTO business system would provide a robust process and the granularity of IET was detailed (benchmarked to Australian UoC), **the P-IET Type Training** (not being driven by UoC) **had marked variety** driven by the FEG's need. **When DASR-147 was introduced, extant IET was translatable, but P-IET Type Training was now being benchmarked against a more demanding standard, and fell short**, requiring unforeseen effort from FEG training staff to align policy and training of RTO that are nowhere near the granularity of the MTO.'*
> **[RT emphasis]**

154.   CDR AFTG advised that the organisation had moved on from earlier hesitation about how to implement DASR-147. CDR AFTG is ACAUST's Learning Management Authority (LMA) delegate. The CDR is the Accountable Manager for the Air Domain MTO, and retains each FEG CDR as an Accountable Manager Delegate. This arrangement[97] provides standardisation for the Air Domain as a DASR-147 that was not previously formally achieved as an RTO.

> *'At the moment there are discernible gaps between DASR-66 requirements, the Defence Learning System and the ability to facilitate an RPL process. The MTOE currently points out, but does not explain gaps, and maybe the RTO is a bit too broad. **A stronger narrative is***

Outcomes_Final BP35507050. 171019 ADF Aviation Sector – DASR 147 Aircraft Maintenance Training Organisations, U8829451. 171122 - Minutes of Meeting - Minutes of 03_17 Air Force Learning Advisory Board (AFLAB) Meeting - 01 Nov 17 BP35507053.

[92] 180919 DASR-147 – Concept Paper, U10334585.

[93] 190503 Minutes of Meeting of the DASA/AFTG DOSA Training Delegation Workshop held on 20 Feb 19 at DPM, BO203137 .

[94] 201123 -Air Domain Implementation Paper, BP36940049.

[95] 230413 Transitioning of Existing Military Aircraft Type Rating Training to DASR 66, BP31126825.

[96] Current Defence Industry MTOs are BAES, Jet Aviation (formerly Hawker Pacific), Sikorsky Aircraft, and Airbus Australia Pacific.

[97] Air Domain MTOE, Part 1 Management, available within fBP3200563.

required. I estimate that it will take six months to achieve closure and make everything more efficient.

I absolutely think we are structured in the right way, me as the Accountable Manager because we are the Learning Management Authority delegate, we understand the learning management system and all the RTO aspects and how that overlaps, Part 145 and Part 66 and are best placed to educate everyone and audit everyone, I am not an advocate for pushing this down to FEGs.' …[**RT emphasis**]

HQAFTG will be seeking internal capability to continually up-issue contemporary qualification under DSR for both growing capability and as more complete employment arrangement for individual recognition upon transition from the ADF. If HQAFTG is successful, Air Domain could provide centralised service to the ADF and Defence industry (as determined by Contract Authority with appropriate controls).

155.   HQAFTG observations on some issues raised by the RT on the current system include the following:

a.   Building upon the current good relationship that the Air Domain MTO has with DASA, there is opportunity for HQAFTG to work together on DASA's UoC mapping review[98] to ensure common situational awareness for the two organisations.

b.   Although the Air Domain MTOE provides guidance for staffing of both 'significant' and 'minor' changes to Type training syllabi, very few 'minor' changes are actually occurring. However, following discussion of some FEG concerns at the recent MTO Conference, the Air Domain MTOE will be updated to provide clearer wording to address 'minor' change approvals.

c.   **The majority of Air Force training devices do not comply with DASR Appendix 3**. The closest is F-35 ITC equipment leading to well-founded statements made during our FEG focus groups that *'we will never achieve full compliance with DASR-66 Appendix 3 in a number of areas, particularly training aids/devices'*. Consensus achieved during the MTO Conference was *[that we] can only go so far as practicable'*, but MTOE Annexes lack the detail as to *'what can be trained on the equipment available'*. Plus there are currently issues recognising *'partial completion of training'* when *'specific training is not done by ADF because it is not needed in the military workplace, but would be done by Industry because that aircraft system is maintained in deeper maintenance'*. This could possibly be managed akin to RTO graduating people with deficiencies where those deficiencies are not a deficit for the workplace[99].

d.   **CDR AFTG summarised that** *'we require AM-delegates to apply a risk-based approach in delivering Type Training to DASR-66 Appendix 3, analysing the use of their current training devices to deliver training SFARP, documenting this in their MTOE Annex, conduct the training and, as opportunities arise, continually adjusting as better training devices become available'*.   [**RT emphasis**]

We recommend that Capability Managers and CASG implement measures to ensure that all future acquisitions include suitable maintenance training aids to allow efficient compliance with DASR-66 Appendix 3 requirements.

156.   We have previously highlighted a shortfall in 'knowledge sharing' forums which has resulted in a divergence of language and lack of a common understanding of the management system for applying DASR. We note that HQAFTG held, only recently (24 Aug 23), their first

---

[98] 230801 DASR 66_147 Review - DASR 66 maturity tasks, BP36480530.
[99] Exclusions against a MAML holders Type rating.

DASR-147 conference since the Air Domain MTO was formed. The RT notes that a summary of proceedings[100] has been issued which, importantly, includes several specific action items to improve common situational awareness and knowledge for managers within the MTO. These actions include:

a. Develop a communication plan to be implemented across the Air Domain,

b. Develop an annual conference plan rotating across Air Domain locations,

c. Develop an Induction course for new personnel posted to Pt147 related positions,

d. Review current processes with a view to better integrating AFLS and DASA requirements, and

e. Develop a program of Professional Development for instructors and assessors within an MTO.

157. **We observe** that creating an Induction course and providing meaningful ongoing professional development for staff managing the AFLS-MTO systems will address, somewhat belatedly, an existing deficit in business practices. As a result of actions recorded above, **we have declined to make any specific recommendation on this issue.**

158. The single Air Domain MTO construct agreed between DASA and AFTG in late-2018 (refer para 150) has recently been contested. During the recent Air Domain 147 MTO Conference, ACG raised the question: *'Why can't we be our own 147 ?'* and HQAC-A9 staff invited discussion on the topic. Post-conference, following ACG consultation with other RAAF FEGs, some further details have been provided and are summarised below[101]:

> *[Having] socialised the concept with SRG and AMG, both were supportive in principle; however, each FEG has different staffing allocations in the DASR QMS and TST space and therefore ACGs concept does not simply align with existing SRG and AMG resources and business processes. They would need more time to contemplate the concept and are concerned about resources. Therefore, noting the limited time frame before your report is finalised, I hope this information provides some context and, at the very least, supports a recommendation for a review of the current directed AMTO construct.*

> *ACG TST is under resourced, and it is unlikely that this will change in the future. Noting that ACG have already put in place about 80% of the ... concept to make use of available resources and existing DASR QM system, which meets the regulatory requirement and integrating existing training governance process within it, is in our opinion a better option than trying to stand-up a HQAFTG QMS who also suffer from a lack of resources.*

159. The ACG submission provides further detail on the hierarchy of Defence education management Working Groups, Committees, and ultimately the Defence Education and Training Board[102] (DETB) who need to address these matters, but apparently some have not met since 2021. Nevertheless, limiting our focus to DASR-147 impacts (per our TORs), **we recommend** a review, internal to HQAFTG's Quality Review Committee, of the current MTO construct to examine whether further efficiencies are possible with revisions to the current model.

---

[100] 230912 Summary of Air Domain 147 Maintenance Training Organisation Conference – RAAF Williams 23-24 August 2023, BP35441458.
[101] 230929 -Pt147+66 Review -ACG 147 Maintenance Training Organisation -TYPE TRAINING, BP36577322.
[102] These include the Air Force Learning Working Group (AFLWG), Air Force Learning Committee (AFLC), and Defence Education and Training Board (DETB).

Recognition of Prior Learning (RPL) – potential for a ADF /Defence Industry service

160.   In early Feb 23, HQAFTG responded to a query from AMG[103] seeking advice on how could '*up to 30 RAF C-130J technicians be Licenced to serve with 37 SQN for up to three years'*. HQAFTG staff explained that current RPL assessments should normally be directed to the Defence RTO but, as that organisation has no organic capability, the assessment activity would be outsourced:

> ***Any foreign military member seeking employment*** *within a 147 MTO who seeks to hold a Military Aviation Maintenance Licence (**MAML) is directed to one of the civilian RTO's** who are recognised by the DASA as 147 compliant. i.e. **Aviation Australia (AvA**). AvA will conduct an RPL process requiring the presentation of documents specified within their RPL package and **additionally requires these members to successfully undertake the CASA approved examinations** at which time they will issue the required Qualification and the member can apply for a MAML from DASA. **The cost to the individual or Service for this option is around $2,000 per applica**ti*on.   **[RT emphasis]***

161.   HQAFTG went on to explain the investment required to establish a standing 'foreign-trained RPL assessment' capability, namely:

> ***Minimum resourcing would be an additional two people with the requisite Vocational Education and Training (VET) knowledge and skills*** *as well as a technical SME to undertake the initial mapping exercise. **Agreement from the relevant foreign military agencies to provide a copy of the curriculum used to train their technicians would be required**. The **mapping exercise time frame would be from three to six months** which includes the development of a suitable RPL package. …. We would need to retain at least one of the additional two people employed in the mapping in order to be able to undertake the RPL submissions, an RPL assessment depending on the package complexity can take up to a week to complete. **It is important to note that the mapping exercise would need to be undertaken separately for each country** and we would need to seek agreement that we would be advised when changes were made to their curriculum in order to maintain accuracy and validity in the RPL process.* **[RT emphasis]**

162.   The matter of RPL for foreign technicians features heavily in earlier paras, and we have already made a recommendation on this matter (para 144). Nevertheless, **we observe** that at some point, a critical mass (this could also include assessing submissions from Defence Industry as a Defence-supplied service) of RPL activity may make it timelier and more cost effective for the ADF to have an organic capability, predominantly focused on RPL for UK and USA trained military maintainers. This observation on RPL for UK and US trained military maintainers is in addition to the related, yet separate DASR initiative for acceptance of UK maintenance training described at para 94.

163.   HQAFTG concluded our focus group discussions providing detail of their contributions to HQAC-A9's review of Air Force trades (refer para 68). They provided copies of the *Aviation Trades Concept Paper – Supporting Detailed Report to AFCC Agendum Paper* # of Jun 23, an updated *'Future State System Maps'*, examples of current AFTG and BAES thinking, and a recent update[104] from HQAC-A9. Collectively, **we observe** that this Air Force activity still has a long path to maturation, hence it appears that this will not provide any near-term step-change improvement for current training conducted at RAAFSTT.

---

[103] 230925 Telecon Crowe/Dorman. Whilst this opportunity did not eventuate, the staff effort reflects the contemporary RPL capacity within Defence., AMG staff were cognisant of the extended time being taken for CPL Y to obtain her Cat-B2 MAML.

[104] 230810 Dunstan Maintenance Concept Paper covering LOGBR Rapidly Expandable Aviation Technical Workforce Concept, BP36576754.

RAAFSTT and BAES training delivery

164.   The RT met with RAAFSTT and BAES staff on 20 Sep 23 to discuss a range of DASR-66/147 issues related to IET training delivery. CO RAAFSTT was candid in presenting an overview of issues that he was facing, advising:

> *Wagga is 'crazy inefficient'. There are issues with effectiveness and efficiency of delivering training at Wagga because of differing service needs, the extended Army B1.3/B2 course duration, an awkward confluence of course lengths, course student numbers, and not being able to drop students between Services courses as vacancies become evident. Successful resolution is stymied as the contract with BAES is outdated and requires reform before transferring planned contract management responsibility over to CASG.*

165.   RAAFSTT is dependent upon their contractor (BAES) for the delivery of Aviation Technical Training[105]. HQAFTG advised that the current contract signed in 2013[106] is not fit for contemporary circumstances and is seeking contract reform[107]. They also noted a limited window of opportunity prior to the planned transfer of contract management responsibility to CASG in the next six months. CO RAAFSTT advised that he requires 'sufficient influence', enabled by an updated contract, to 'effect change for an agile Wagga'. Creating a more agile contract will also assist Air Force to realise its planned 'rapidly expandable aviation technical workforce concept'. AFTG advised that this concept has not yet been presented to AFCC and, if progressed, will still take some years to achieve the desired workforce changes. CDR AFTG advised that, with increased volatility and changes in the strategic climate as detailed in the recent Defence Strategic Review (DSR), he is well aware of the need to ensure that RAAFSTT does not become a choke point for the generation of ADF aircraft maintenance workforce and is pursuing contract reform to achieve improved training outcomes. Collectively, **we observe** that contract reform will better enable any near-term step-change for training conducted at RAAFSTT, be that ad hoc, trials or accelerating elements of Air Force current work in progress.

166.   **Army trial course to generate a Cat-B License.** RAAFSTT provided information[108] on challenges associated with a recent Army trial course aimed at generating a Cat-B Licence. RAAFSTT has traditionally managed some planned variations between the three Services. Another recent example was Army's trial of two DASR-66 aligned courses (for Aircraft and Avionics technicians) delivered by BAES using an EASA Part 66 compliant training package sourced from the UK. The RT compared the content of the previous Army Avionics and Aircraft Technician courses against the new courses[109]. This showed a net increase of 'Student [training] Days' from 232 to 348 for the B1.3 course (reflecting increased scope for electrical and structural training), and 262 to 268 for the B2 course. The quoted 'Student Days' only reflect IET technical training and omits the military component and time added by weekends, public holidays, mid-course breaks'. Hence total calendar days[110] spent at Wagga better reflects workforce commitment to training and unavailability to Army. The long-term average time at Wagga on the previous Army Aircraft Technician course was 333 calendar days, and the Avionics Technician

---

[105] 130211 DGPERS-AF/AB9766721 AFOD 2012-05 paras 5, 8-9, 11-13.

[106] Original Aviation Technical training (ATT) contract between HQ AFTG and BAES signed in 2013.

[107] 230427 – Brief for CDR AFTG: Aviation Technical Training Contract Reform, BP32357162.

[108] 230920 - Simmonds - CAMM2 trg DB - DASR66/147 Focus Group - RAAFSTT/BAES - Follow-ups, BP36576153. 230922 Simmonds - DASA66/147 Implementation Review - RAAFSTT RFI Responses, BP36575156.

[109] BAES are yet to update the ATT Segment Diagram to reflect the Army trial courseware. Superimposing the MEA UoC listed in BAES's MEA40718 Cert-IV in Aeroskills (Mechanical) and MEA40618 Cert-IV in Aeroskills (Avionics) on BAES ADF Aviation Technical Training Segment Diagram of 16 Mar 22 shows; retention of Aerospace Technical Trades Core Skills, greater utilise the Aerospace Avionics Fundamentals, wholesale replacement of Avionics Common and partial replacement of Mechanical Fundamentals and Aircraft Common.

[110] 230922 Simmonds - DASA66/147 Implementation Review - RAAFSTT RFI Responses, BP36575156.

course 386 calendar days. Granular data was provided by the Army Liaison Officer (ALO) for both Army trial courses[111]showing the extended course refinement and delivery curve for the trial activity, particularly evident for the first few B1.3 courses. The ALO expects a continuation of the down trend towards the historic average in the low 500 days, re-establishing the historic administrative overhead ratio. **We observe** that RAAFSTT requires the agility to enact comparable changes to training delivered by BAES, but more efficiently than is being achieved for the Army trial.

167.   **Part 66 B1.3 and B2 Module training leading to Cert-IV qualification.**   BAES provided their current Training and Assessment Strategy (TAS)[112] for Army's trial courses. These courses deliver the B1.3 and B2 outcomes following completion of Part 66 Modules with only an E62 Exclusion (which is removed following Skill Grade 3 (SG3) training prior to promotion to CPL). The TAS has been tailored for Defence as a result of cooperation between BAES, DASA and AAvnTC to scope the additional Units of Competency required to gain a Cert-IV qualification rather than a Diploma. This collective management effort has saved resources that would have been expended if Defence had adopted CASA's position on a Diploma qualification[113] as stated:

- *Diploma in Aeroskills (Avionics or Mechanical) as the basis for employment as a Cat-B LAME,*
- *Cert-II in Aircraft Line Maintenance for the holder of a CASA A licence*

BAES also provided mapping of the two Cert-II qualifications into the Aeroskills Cert-IV programs that showed gaps in training continuity along with a number of Cert-II elective MEAs that provide no benefit towards either a Mechanical or an Avionics Cert-IV. Given this mapping effort, BAES believe that they can create a more efficient system for an ADF career pathways where a Cert-II is intended to build to Cert-IV qualification. **We observe** that the Australian Cert-II to Cert-IV is not designed to articulate training, and without reform, will result in increased overall training for those maintainers progressing to a Cat-B MAML.

P-IET Training conducted by FEGs

168.   During our FEG focus groups, we received considerable verbal and written feedback[114] on difficulties complying with DASR-66/147 requirements for the provision of Type Training. Matters included processes, resourcing, implementation, issue resolution - all complementing the issues raised above during our HQAFTG focus group discussion. FEG frustrations over difficulties, from a customer viewpoint, are covered well in the extract below:

> *The responsible persons within HQAFTG (AM, QM and Training Manager) and their staff have not provided the level of support FEGs require to set up 147/66 complaint organisations. CDR AFTG is the Air Domain DASR-147 AM, HQAFTG SO1 Learning Assurance is the Air Domain QM and DoSA(T), HQAFTG DLS is the 147 Training Manager – their responsibilities are defined within the AMTOE. The majority of responsibilities are being delegated, without the necessary guidance to FEGs for implementation. FEGs have been required to work it out and apply applicable processes via Maintenance Training Organisation Annexes. Maintenance Training Organisations within FEGs are not resourced with Training Specialists who understand the integration of AFLS QMS with the Regulatory QMS requirements. They are technical folk with some training experience and therefore are more comfortable reverting to the Regulatory Black and White and integrating the two*

---

[111] 230925 Rose - Army Course Actual Calendar Duration, BP36575458.
[112] MEA40718 Cert-IV in **Aeroskills (Mechanical)** (Rev B), BP36677150, and, MEA40618 Cert-IV in **Aeroskills (Avionics)** (Rev A), BP36677148.
[113] Companion Volume Implementation Guide of Nov 22 for MEA Aeroskills Training Package Release 5.0 pp28-29, VETNet: Home and CASA AMC and GM CASR Part 147 Section 2.2.
[114] 230719 Turnbull - DASR 66-147 Review - RFI - Defence Aviation Safety Regulations 147, BP36546220.

*systems is proving to be a difficult process. **Air Force has lost it voice regarding the undertaking of a risk-based approach assessment when determining whether compliance to 147/66 is disproportionate to the intent or need.** RFIs through AFTG are forwarded to DASA for an answer.*

'Recognition of Prior Learning' vs 'Recognition of Current Competence and Experience':
*…the **adoption of a pragmatic approach to the assessment of current competence** rather than **assessment alignment of learning pathway assessments**, both theoretical and practical, is **an item of discussion that the Air Domain AM, not individual FEGs, should be taking to DASA** as this issue is affecting lateral recruitment and partner interoperability effectiveness.* **[RT emphasis]**

The latter comment refers to achieving a coordinated approach for RPL initiatives across the Air Domain (refer paras 96, 144 and 162). **We observe** the 'growing pains' of the Air Domain MTO and recognises that the construct has yet to stabilise, especially to address challenges presented by changes to Type training at FEGs. Also, **we observe** that situational awareness can be improved by holding regular internal and external conferences, Working Groups and Boards to exchange information and achieve strategic alignment, but not necessarily resolve resource limitations.

169. Further commentary from FEGs highlight a need to better leverage off current RTO practices, along with possible need for training organisational re-allocation to achieve compliance with DASR-66/147 requirements:

> *The integration of the existing Air Force Learning System (AFLS) overlayed with the DASR 147 requirements is a feasible option – <u>if</u> the MTOE and application of existing AFLS processes were deemed as an AMC. However, **due to the prescriptive detail Part 66 Appendix 3**, the **existing AFLS QMS does not align** and therefore 'training' does not meet the regulatory requirements and **must be re-designed** and re-developed, all of which requires allocation of resources. **In some cases, compliance cannot be guaranteed unless elements of practical training (in addition to the OJT) is moved into Operating Squadrons**, and this is not seen as either a 'need' nor currently supported.* **[RT emphasis]**

We acknowledge the author's intent but see a need to rephrase the issues, which have been fused, into three key questions. These are presented below, along with our assessment on status and future resolution:

- *Can the 'gaps' between RTO and MTO be better defined so that the two learning systems can be better integrated?* **RT comment**: We were advised that HQAFTG is seeking to undertake this activity.

- *Can the processes used to develop Type training under the AFLS be 'aligned' within the MTOE and thereby become the pragmatic 'acceptable means of achieving' what are considered more prescriptive DASR-147 requirements?* **RT comment**: Planned DASA and Air Domain staff effort, as well as recently proposed Air Domain professional development activity[115], should focus on progressing this point.

- *DASR-147, and more specifically DASR-66 Appendix 3, has exposed a significant shortfall in the availability of compliant training devices for Type training, but is the only recourse a need to use live aircraft located in an operational squadron?* **RT comment**: DASA staff have recently advised that they will take a 'flexible pragmatic approach' on training devices, including use of simulation, that will be documented in a DCA 66/147 strategy and planning document to be developed during 2024 and linked to the DCA business model. CDR AFTG has also provided a clear position (para 155) regards *'applying a risk-based approach in delivering Type Training to DASR-66 Appendix 3'*.

---

[115] From 'Summary of Proceedings' of recent MTO Conference (24 Aug 23) – discussed above in para 150.

170.   To summarise, **we recommend** that DASA, AFTG and HQAC-A9 examine the merits of both adopting AFLS processes (or part thereof) within Authority endorsed documents such as the MTOE and HQAC's AFCAMAN, and options for practical training in the context of 'adapting' DASR-147 to better leverage RTO practices.

171.   We wish to acknowledge Army's experience with the level of effort and resources required to align training to DASR-147 requirements showing that it is not 'resource neutral' - as disclosed in Army's 'Specialist Service Soldier Trial' (SSST) Discussion paper[116]:

> *The SSST has suffered some delay from a RAEME Aeroskills Technical Specialists (ATS) perspective associated with the restructuring of training programs and the general understanding of Military Aircraft Maintenance Licensing (MAML) under DASR. While the introduction of DASR underpinned the development of the Specialist under the ATS Trial, **the introduction of the regulations to the wider Army Aviation capability resulted in some significant changes to policy and management practices.***

> *Army has worked closely with DASA, primary stakeholders and regulators over the last six years to **enhance** the development and management of the **software and hardware required to develop appropriate training packages which are DASR-147 (Training) and DASR-66 (Licencing) aligned.** [RT emphasis]*

We recommend that the DASR-147 Air Domain MTO (HQAFTG) and the FEGs who are delivering Type training be prioritised and resourced commensurate with the agility expected from the training system; if not, FTFs accorded close management to minimise the disruption of being a known training 'choke point' restricting capability.

172.   **We observe** the relative agility shown by both Navy and Army to optimise their respective training systems to align with DASR-66/147 requirements. As examples, Navy have repatriated a significant amount of IET from Wagga to Air Affairs at Nowra concurrent with increasing the course content for an overall reduction of 'time in training'. Army have worked with BAES and DASA to create DASR-66 aligned B1.3 and B2 IET courses under trial at RAAFSTT (refer para 141) and made corresponding adjustment to Type Training at AAvnTC to achieve the full DASR MAML and Type Endorsement outcomes they need. This has, in part, been enabled by use of better training devices and end-to-end IET-PIET training management organic to their FEG. Interestingly, these changes raise some challenging questions which are clearly outside our TORs, but we include for future consideration. These include: *..Is collective training at RAAF Wagga becoming an anachronism? ...replaceable by dispersed IET training that is optimised for FEG capability needs (including partial licences with Exclusions), ...and the ability to complete 'just in time' gap training as individuals move between FEGs and Exclusions being removed or Inclusions added?*

173.   Exploration of these questions and alternate options is beyond our TORs. Although we fully endorse the long-standing approach of 'one training system for all ADF aviation technicians' that aligns with high-level Government and Defence strategic policy, we see value in the added flexibility and agility in movement shown by some recent Navy/Army initiatives to optimise training aligned to local capability needs. Hence **we recommend** consideration of a Review by AFHQ (LOGBR), in consultation with Army AVNCOMD and Navy FAA, to examine centralised and dispersed options for optimising IET and P-IET delivery for the three Services, recognising the flexibility and multiple career pathways being considered by HQAC-A9 and AFHQ (LOGBR) that, along with Navy and Army career pathways, collectively meet CDF Directive 16/2022.

---

[116] 220927 APCSG Task_SSST FIC Analysis Noting Brief _AVN Perspective#2 marked, para 11, BP35538569.

Simplifying Journals to track Technician competency progression between Organisations and during Career

174.   On this topic, we received feedback from all FEG focus groups of frustration with the high workload and complexity of managing up to four 'journals/log-books' to track technician competency progression as they move between organisations and over their career, prior to issuance of a MAML. These include the current Cert-IV skills log, Practical On Course Booklet (POCB) and OJT Training Record. Frustrations and challenges were expressed in several ways, including the following extract from a recent SQN AwB submission.

> *Compliance with DASR 66 Appendix 3 requires completion of an (On the Job Training) OJT workbook. The development of this workbook is subject to very prescriptive guidance regarding its content. Failure to complete the workbook within the prescribed timeframe impacts B MAML attainment.*
>
> *Development of the C-130J OJT workbook has been complicated by the DASA requirement to include tasks and systems with complexity that exceed 37SQN normal maintenance scope.* ***This has resulted in initial trainees placed at risk of failing to complete the workbook within the required timeframe of 3 years, and has required issuance of interim MAMLs.*** *Further, there is potentially* ***significant redundant effort*** *related to* ***concurrent completion of the DASR 66 OJT workbook and the Certificate-IV in Aeroskills workplace journal*** *due to overlap in these requirements.* **[RT emphasis]**

175.   Further expanded detail on frustration in SRG was provided by P8 Deputy CAM (DCAM) which, as a result of RT questioning and guidance, has developed into an extensive email trail[117] expressing keen interest in examining Army's single eJournal for possible adoption. We note the most recent SRG position and planned action as recorded in the following comments (dated 13 Sep 23):

> *In short****, SRG is highly supportive of the [Army] e-journal*** *and, in particular,* ***supportive of the concept where a single signature can be used to sign-off like tasks across the multiple journals*** *to streamline journal requirements, management etc. There is further background in the email trail below, and WGCDR [xxx, P8 DCAM] from HQ 92WG has provided an excellent explanation of the current journal arrangements and associated recommendation in his email dated 11 Aug 23.*
>
> *Also …****92WG are very keen to implement the ejournal due to its ease of use and the potential to combine journals and reduce time in the future.*** *Currently the RAAF is completely paper based, the unit UTC will normally review each journal and process manually as required, which is then sent to the VET manager who also review and then award the Cert-IV. ….. Air Command would need to approve an initial trial at 11SQN and, if successful, role out to all SRG units. How that would be staffed or who would approve is the question and how we get this moving?*

176.   To ensure that frustrations expressed above by Air Force FEG staff on this topic are addressed, we strongly support the initiative shown above within SRG and **we recommend** action by HQAC-A9 staff to approve the conduct of an initial trial to assess potential efficiencies in process and resources associated with adopting the Army eJournal whereby a single signature can be used to sign-off like tasks across the multiple journals to streamline journal requirements.

177.   Incidentally, when assessing potential resource issues, we wish to record comments provided during our focus group meeting with RAAFSTT staff of the need for extra DPN

---

[117] 230914 -Single eJournal for Technicians, BP36920485.

workstations in practical training areas to allow BAES instructors to directly access Army's e-Journal to validate/certify trainee task progression, negating waste associated with current manual sign-offs arrangements[118]. This resource bid will attract higher priority if RAAF takes up the e-Journal to achieve benefits for to ADF technician graduates.

CAMM2 training /courseware

178.   Another issue raised in focus groups was sub-optimal alignment of CAMM2 and related publications with DASR-145/66 terminology and certification requirements, resulting in the development of workaround practices (recorded in SI's) and adopted as standard business practices. While providing the required assurance, these practices are sub-optimal. However, more concerning was feedback from RAAFSTT on courseware used for some CAMM2 training, specifically the CAMM2 Data Manager course. This is an eight-week P-IET course delivered at RAAFSTT by BAES. The current course is eight major releases behind the production environment and courseware is significantly outdated with no significant update since 2013. Full details are provided in AFTG HQ Ground Training Wing Brief[119] (dated 10 Jul 23). Importantly, current courseware does not cover CAMM2 CRS functionality, references dated DGTA-sponsored publications that were superseded following DASR roll-out, and receives consistent negative feedback associated with negative training. This adds to the theme of 'mangled language' raised earlier by the RT. More importantly, the sub-optimal alignment of CAMM2 and CAMM2 training to DASR-145/66 terminology and certification requirements is documented as a contributing factor to some aviation safety events. The following extracts from the AFTG Ground Training Wing Brief illustrate.

> *…both RAAFSTT and BAES are uncomfortable with continuing to deliver what amounts to negative training to personnel working in roles that are critical for the effective management of continuing airworthiness.*
>
> *Since 2013 the courseware has not seen significant update and in its current state is introducing negative training.*
>
> *The courseware does not cover the CAMM2 Certificates of Release to Service (CRS) functionality, which has been in use in the live CAMM2 version for the past two years.*
>
> *Course exams are outdated and do not align with the CAMM2 system, Data Manager Courseware, or Defence Aviation Safety Regulations (DASRs).*
>
> *CAMM2 training has also been identified as a contributing factor in several aviation safety events. Most notably, the Class B - MRH90 Taipan Maintenance Policy Overfly Events investigation conducted by the Defence Flight Safety Bureau (DFSB) in December 2020 (Reference D). The investigation found numerous prior recommendations targeted at CAMM2 training shortfalls at RAAFSTT.*

179.   Limiting our focus to DASR-66 implementation issues and noting the limited distribution of this Brief (eg, DASA not cc'ed), **we recommend** that AFHQ LOGBR as a matter of urgency, remediate the identified inadequacies of CAMM2 training.

---

[118] 230920 - Simmonds - CAMM2 trg DB - DASR66/147 Focus Group - RAAFSTT/BAES - Follow-ups, BP36576153.
[119] 230710 Brief for DDLIST: CAMM2 Data Manager Course Remediation. BP33634973.

PART 4 –DASR-66/147 OPERATING IN NATIONAL/INTERNATIONAL CONTEXTS

Potential opportunities for greater CASA alignment

180.   The RT engaged with the CASA Maintenance Personnel Licencing seeking information on any CASA initiatives that might be relevant to our Review TORs. This engagement identified two initiatives which are addressed below.

181.   **An alternate License pathway**. Over the last two years, CASA has provided a *'CASA self-study, examination and experience'* pathway[120]. This pathway aligns to the Part 66 Knowledge training syllabus and examination standards requirements found in CASA's *Part 66 Manual of Standards (MOS)*. Self-study includes a practical assessment pathway using the Part 66 Basic practical experience logbook. CASA advised that a person seeking a licence on this pathway does not get any 'basic knowledge' credit or advanced standing for any previous MEAs gained from a MTO but may get 'practical experience' credit from recorded workplace maintenance experience. However, this was not to be viewed as a 'dead end', rather a different pathway as the person can seek MEA RPL of completed *'CASA self-study, examination and experience'* modules through a MTO, which can be combined with completion of other MEAs, and collectively combined for a qualification outcome (Diploma for CASA) to seek a Licence. **We observe** that there is no reason why Defence cannot establish this 'now' using the DASR-147 Air Domain MTO to conduct RPL of the Part 66 course modules and subsequent blending with existing MEAs. The yet-to-be-defined level of effort in this work contributes to the 'critical mass' for creating an in-house RPL capability (refer para 162).

182.   CASA are seeking a Legislation change to CASR-66.072 to enable the CASA Licencing Team to use results from the *'CASA self-study, examination and experience'* pathway for Licence Exclusion removal. This could be in place late 2024. **We observe** that Defence could adopt this approach immediately as DASA is not constrained by the same Legislation as CASA.

183.   The CASA Licencing Team sees no impediment to Defence adopting the *'CASA self-study, examination and experience'* pathway. In this case, an ADF trainee would be required to enrol with CASA, have an Aviation Reference Number, undertake exams with results recorded within the CASA system, and Defence personnel can extract an 'exams statement' for a nominal ($25) cost. The only caveat is a 10-year limit applied to the expiry of module exam credits, at time of application for a licence. **We observe** that there is no requirement for Defence to duplicate this infrastructure - indeed, the common data would aid workforce transition across the civil-military aerospace sector. The *'CASA self-study, examination and experience'* pathway also allows the 'experience' from relevant military aircraft to be recognised by CASA. For example, P-8 aircraft (having an underlying civilian Type) with additional military systems could result in a person holding both a CASA LAME and a DASR MAML (with military system Inclusions), having come through the one training system.

184.   **CASA's new Modular Licensing Framework**. Over recent years since the introduction of CASR Part 66 in mid-2011, CASA has received submissions from Industry indicating that Part 66 licence pathways are too inflexible in comparison to the previous CAR-31 licensing system. As a result, *CASA – Discussion Paper: Part 66 Modular Licensing Framework* [121]was issued outlining key features of a more flexible, modular approach to AME licensing within the Part 66 framework. Following consultation, an amendment to CASA Part 66 MOS is expected to be issued in Dec 23 and includes provision for tailoring CASA practical experience logbook to a partial licence (such as 'airframe' vs 'engine') as sought by individuals, meaning that the initial

---

[120] Part 66 self-study training and examination pathway | Civil Aviation Safety Authority (casa.gov.au).
[121] CASA Discussion Paper DP 2218MS of Dec 22, BP35472924
CASA Pt66-Tech WG-Mtg7 -5Jun23, BP36764364. CASA Pt66-Tech WG-Mtg8 -29Aug23, BP36764366.
231024 Draft information sheet - Modular licence - how does it work, BP36725674.

Part 66 Modular licence can be achieved in a minimum of two years. CASA advised that AvA has completed a mapping exercise and has shared this with other MTOs. CASA expect that after a short period for MTOs to finalise their course adjustment (their own mapping exercise that will be reflected in their respective MTOE), MTOs will start offering this training pathway to the public. **We observe** that the transparency provided by MTO's mapping their courseware will be an excellent starting position for ADF workforce managers to design future staggered/progressive training pathways for the respective workforces.

185.   CASA also advised that a *'Consultation on Modular Licencing'* paper will be released shortly and will confirm that LAMEs working within a Part 145 AMO will have the 21-yo age restriction for issuing a CRS. There is no decision yet by CASA on how that 'restriction' will be treated within a CAR-30 AMO. The CASA Modular Licence will retain the 18-yr age restriction for holding a Licence.

186.   CASA's new Modular Licencing will retain recognition of training as a "skilled worker" as an option that provides earlier licensing outcomes with respect to the amount of practical experience required to qualify for a licence. This is consistent with the existing arrangements of the Part 66 MOS, section 66.A.30 – *'Basic practical experience'* requirements. We note that DASR has no GM that defines a "skilled worker in a technical trade". On the other hand, CASA AMC/GM[122] provides the following detail:

> **Relevant training as a skilled worker in a technical trade,** *acceptable to CASA***, a licence applicant could provide** *as evidence* **to CASA when applying for a licence,** *could be vocational training and/or qualifications* **in the following technical trades***:*
>
> - *Automotive. Apprenticeships, traineeships in heavy or commercial vehicle (such as diesel motor mechanic), light vehicles etc.*
> - *Electrotechnology. Includes design, maintenance, installation and repair for all electrical and electronic equipment, such as a licensed electrician, electrical fitter.*
> - *Engineering. Apprenticeships, traineeships in an engineering trade specialising in mechanical or fabrication within metal, engineering, manufacturing and associated industries.*
> - *Telecommunications. Apprenticeships, traineeships in the telecommunications stream.*
>   - *This would teach skills and knowledge of the technical functions behind general information and communications technology, including dealing with tasks associated with network administration, open cabling and software applications.*
> - *Aviation – such as military careers.* **[RT emphasis]**

Accordingly, **we recommend** that DASA provide "skilled worker in a technical trade" GM for DASR-66.A.30(a).

Leveraging DASR (and use of Cat-B MAMLs) during Mobilisation

187.   The introduction of DASR provides potential increased flexibility for a DASR-145 MO workforce to rapidly expand by including people without a traditional aviation trade background, during times of mobilisation[123]. Specifically, DASR-66.A.30 lists experiential requirements for people with *'no previous technical training'* or *'training considered relevant by the NMAA'* who can be authorised to perform maintenance, either under supervision or authorised to complete TSO for work performed at the discretion of the MO Responsible Manager. Work performed by these non-aviation trained technicians needs to be '**verified**' (using DASA and EASA language,

---

[122] D22/391479, Continuing Airworthiness - Aircraft Engineer Licences and Ratings, AMC and GM, V7.2 Jan 23. pp28-30, Part 66 of CASR Continuing airworthiness aircraft engineer licences and ratings | Civil Aviation Safety Authority (casa.gov.au).
[123] Or 'Agile Operations' – refer CAF Directive 06/23.

or '**ensured**' using AFCAMAN language) by a Cat-B MAML holder, who then completes the CRS for that task or collection of tasks. The ADF and Defence Industry currently benefit from a highly proficient workforce, educated in MEA units of competency, which are packaged to provide trade qualifications relevant to aviation maintenance. DASR-66.A.30 provides flexibility to use lesser trained and skilled people to contribute to the generation of capability in a controlled and risk managed way.

188.   A pathway for mobilisation in the Aviation Sector could draw upon 'relevant' trades (such as including electricians, vehicle mechanics, sheet metal workers, possibly extending to trade assistants in these industries) with supervision by an appropriately authorised traditional aviation trade background person and culminating with task activity verification by a Cat-B MAML holder. Two factors critical for the success of this mobilisation pathway will be the number of traditional aviation trade background personnel, and the number of MAML holders available to **supervise** (then CRS) the increased 'non-aviation trades' workforce. As stated by EASA[124], …*the presence of certifying staff and support staff is an additional safety barrier and … has the function of coordinating the different tasks, supporting those mechanics in case of any mistakes or unexpected difficulties and verifying that the job has been completed and signed-off properly.* For a given maintenance liability, ADF workforce models that have narrowly defined 'traditional aviation trades' will initially require more people to supervise the 'non-traditional aviation trades'. ADF workforce models that do not have either a surge capacity within the Cat-B MAML workforce, or ability to grow a Cat-B MAML holder aligned to a mobilisation schedule, will significantly impede prompt realisation of the mobilisation effect.

189.   **We observe** that opportunity exists to make good use of DASR-66.A.30 provisions in two distinct contexts as follows. Firstly, a rapid mobilisation context where additional maintenance capacity needs to be generated swiftly for short operational surge periods. Secondly, an enduring context where operational demand is routinely met through a mix of traditional (fully qualified) aviation trades who are assisted by lesser trained and qualified people in a 'trades assistant' capacity. The return on investment in training, authorisation (only to task sign-off level [TSO]), supervision and certification will vary from context to context, but we consider this an opportunity worth highlighting at the enterprise level for potential pursuit at the discretion of each FEG.

Potential for Increased Interoperability with coalition forces

190.   In our extensive readings, we observed many claims that implementation of DASR, including DASR-66, would lead to increased interoperability with coalition forces. One such claim from one of the earliest referenced DGTA papers[125] follows:

> *The EMAR convention is currently being adopted by European forces and provides a framework for enabling interoperability.* ***The framework could be extended to cover other forces, notably the US military.*** *Such extensions will be common among US allies using an ICAO-based convention, many of whom are also partners in US military programmes and simplify mutual recognition activities and agreements.* **[RT emphasis]**

191.   While we fully support this aspiration, some caution is required if the current firm approach of DASR-66/147 implementation is maintained. Looking at the specific reference to '***US military*'** in the words above, **we observe** that, until the US military moves closer to adopting/adapting EMARs, trying to achieve mutual recognition at a granular level (such as for DASR-66 and 147 where the education system, trade boundaries and employment concept have

---

[124] 151217 -EASA policy on Certificates of Release to Service (Dec15), para 8, BP35472897.
[125] 130808 -DGTA Position Paper -A Long Term View of Technical Airworthiness Regulation in Defence, para 33c, BP35472907.

different building blocks) will only generate friction. Noting that the words above were written around the ten years ago, we see little evidence of a practical application of EMAR in achieving better interoperability with the US military. The recent ACG trial with USMC (refer paras 97-98) provides an example of the need to temper expectations, including to those earlier comments in this Position Paper (para 11):

> *…The differences in the systems of each nation need to be acknowledged, but not overplayed. Signatories to the Convention have systems that are broadly compliant, consistent, and interact easily.*

192.   Looking specifically at **interoperability with** the **US military, <u>we observe</u> that firm adherence** to DASR-66 and its application in DASR-145 for the Licence holder authorised for CRS *'because it will help achieve better mutual recognition'* with allies (US and UK) **is a nugatory argument** as it will never be achieved until the US/UK military[126] shift their education system to accommodate EMAR/ DASR-66. More pragmatic approaches seeking to leverage touchpoints between DASR and US and UK systems remain open and can be pursued.

193.   Extending this theme, **we support the aspirations** presented in the 2016 *Status Brief on New Defence Aviation Safety Regulation*[127] **below**:

> ***To support the fighting force of 2025 and beyond, the future Defence airworthiness regulatory framework should be flexible*** *enough to maximise Commanders' freedom of action;* ***be easy to understand and use****; provide our people the highest levels of safety assurance; be cost efficient (by imposing the minimum necessary market barriers on commercial organisations);* ***be as familiar as possible to coalition/regional partners to enhance interoperability and align to ICAO principles so that military*** *and civil* ***sustainment arrangements can be blended*** *where appropriate* ***to exploit military*** *and commercial* ***opportunities*** *and, as a result,* ***strengthen Australia's national air power****.* **[RT emphasis]**

194.   On these points, we note that the 'Airworthiness Recognition of the Military Aviation Authority of the United Kingdom' has culminated, and their Military Maintenance Organisation (MMO) will not be added to the recognition certificate. To cover this gap, **<u>we recommend</u>** AFCAMAN promulgate 'best corporate practice' for a CAMO to follow when allotting a State Aircraft into a UK MMO in AFCAMAN Book3, Ch 2, as a standing artefact in satisfaction of AMC DASR-M.201(g)2.

195.   Early in our Review we examined a paper by the UK MAA[128] that formally documented the background analysis that justified its decision **not** to implement EMAR Parts 66 and 147. This paper (15 Jun 20) was a 'second look', updating its earlier 'initial look' decision five years earlier in 2015. The paper records the UK MAA's decision to implement certain EMAR covering three main areas (Parts 21, M, 145) as:

> *'…these specific EMAR were assessed to be of clear benefit to the UK DAE due to shortfalls in existing policy and/or anticipated improvements in air safety and reduce risk to life'.*

However, they were not convinced of similar benefits from implementing EMAR-66/147 as recorded in several extracts below.

---

[126] 230223 *REME Aviation Training Strategy – The plan to 2030* of 23 Feb 23. From Nov 24 onwards, the British Army is training the REME workforce towards a UK CAA Pt66 Cat-A3 licence, and by mid 26 will have a CAA Pt66 Category B licence education and experience pathway, BP35238833.
[127] 150521 Status Brief on New Defence Aviation Safety Regulation, para 6, BP35472936.
[128] Evaluating the benefit of licencing military aircraft engineers, 15 Jun 20, <u>Evaluating the benefit of licencing military aircraft engineers - GOV.UK (www.gov.uk), BP32466217.</u>

'…implementation did not align to the MAA's continuing aim to produce only regulation that is targeted and proportionate, whilst minimising burden across the regulated community (RC).

*'…**Implementing these EMAR** …would constitute a **medium scale change programme** of up to 10 years durations. The internal MAA resource bill for this change programme is acknowledged to be significant.*

*'**Concerns were also raised over the highly prescriptive and mandatory structure of the part 66 basic course** (that is the AE foundation training course). It departs significantly from that of the existing, flexible, single service, phase 2 training and phase 3 career course requirements and content. **This results in increases to training course length and potential impacts to trade and rank structures.'***

*Previous MAA attendance at each of the MAWA forum, the continuing airworthiness advisory group (CAWAG) and the European aviation maintenance training committee (EAMTC), helped confirm the wide acknowledgement that EMAR 66 is the suitable vehicle and benchmark for aviation technician training. **However, in its current form, the consensus is that some elements are too rigid and outdated.***

The last update to EMAR 66 was completed in 2014. The next edition is not expected to be published before the end of 2023 due to EDA resource constraints and lack of task prioritisation.

***Sustained pressure is being applied** by the international RC **to have EMAR 66** and its associated training syllabi **updated sooner to incorporate new learning technologies and competency-based training to facilitate a more flexible approach to training delivery**. These changes would align more favourably with existing UK defence training policy, teaching methodologies and flexible training requirements.*

*…**Subsequent reviews would only be considered when**…there are significant and/or favourable changes to EMAR that either better align them to the existing UK approach to training and/or they provide more modern and flexible options for the scope and delivery of future technician training. [RT emphasis]*

The extracts above show clear reservations from the UK MAA to implementing EMAR-66/147 at the time. It also highlights specific issues that generated concern and a pathway for future review. The UK decision was likely valid in the short term (cost vs reward) but once matured and adapted to service needs, would likely be missing significant opportunities in the longer term – particularly with maintenance workforce agility, efficiency, and interoperability. Lastly, the paper also notes that reservations were primarily from the internal military community whereas '*The Industry view was more strongly in favour of implementation*'.

196.   **Future UK Military initiatives on Maintenance Licensing**. As noted earlier (para 92), we undertook a 'deep-dive' of the current UK MAA approach and plans for future licensing of maintenance technicians. We note that the British Army is leading both RAF and RN with a number of initiatives to align its training and licensing with the UK CAA.   They are already well advanced in setting up a single CAA-aligned Cat-A license pathway and will have a Cat-B licence pathway by mid-2026 - when the MAA expects to have created its own licencing system and can issue their own 'military' licence. RAF and RN are closely 'watching' Army progress. Army reports excellent cooperation from the UK CAA who also see the military as a future source of civilian licence holders (known quantity) given they also have an impending chronic civil aviation workforce shortfall. Full details on how the UK MAA plans to further 'adapt' its use of Part 66 and 147 are presented in **Annex F.**

Early DGTA assessment, Interoperability expectations, and Adapting for the future

Early DGTA assessment

197.   Part 1 (Background) of this report revisits and examines the rationale for reforming the Defence Aviation Safety framework to align with a contemporary, internationally recognised, ICAO-compliant aviation regulatory system. To recap, DGTA assessed in 2013 within a *DGTA Position Paper*[129] that, **although full implementation of all technical-related parts would yield the most benefits long-term**, **Parts 66 and 147 also represented the most complex and challenging option to implement**. Having reviewed the implementation of DASR-66/147 six years later, we find both aspects of this early DGTA assessment to be remarkably true, and noteworthy per the following expanded comments.

198.   **'Full implementation of all technical-related parts would yield the most benefits long-term'.** Our assessment, based on analysing six years of lived experience by DASA and the regulated community, is entirely consistent with this DGTA prediction in 2013. We base this assessment on appreciation of the 'total system' nature of the DASR regulation set. That is, all parts of DASR combine to comprise an aviation safety regulation set that complements the ADF and Defence Industry workforce working in maintenance organisations to generate military capability. This is a socio-technical 'system of systems' and must not be reduced to its finite elements. DASR-66 and -147 are central elements of the DASR 'system of systems' and essential to a healthy, deliberately designed, end-to-end DASR operating model. More broadly, all DASR-66/147 and DASR-145/M best interact in harmony, as designed, to enable optimised maintenance operations. Our review has led us to concur with the original DGTA assessment that implementing all five technical-related parts of DASR will yield the most benefits long-term.

199.   **'Parts 66 and 147 also represented the most complex and challenging option to implement'.** Our assessment, along with feedback from the five years of lived experience by the regulated community, supports this DGTA prediction entirely. This report highlights the need for improved alignment between DASR-66/147, workforce structures and training systems. We recognise that aligning these and other interfaces with DASR-66/147 is both complex and challenging but some areas of Defence have made good progress. There is not a universally 'correct' approach to workforce structure and training under DASR-66/147 which means that each operator needs to make its own appreciation of the best approach with due regard for its unique requirements. Pursuing the maximum long-term benefits of DASR-66/147 has proven both complex and challenging and we assess this approach will prove worthwhile. We note that the initial DGTA recommendation was **not** to implement DASR-66/147 at the same time as DASR-21/M/145, which would have aligned with the more cautious approach taken by the UK MAA (refer para 192). However, we support the Air Force Board decision to do so in the interests of yielding the most benefits long-term (*Decision Brief for Defence Aviation Authority*[130]). Excluding DASR-66/147 from the overall DASR implementation may have been feasible, and certainly less complex and challenging, but would not have been optimal in the longer term.

Interoperability expectations

200.   Following the decision to implement DASR-66/147, there was a strong expectation that Defence would benefit from greater 'military to military', and 'military to civil' interoperability. This expectation is clearly evident in documentation examined in Part 1 (Background), also within the leadership narrative that accompanied the change, and lastly within the focus groups during this Review. Since our implementation, we have noted varying levels of international

---

[129] 130808 -DGTA Position Paper -A Long Term View of Technical Airworthiness Regulation in Defence, BP35472907.
[130] 131127 -Decision Brief DefAA -Concept to Redesign Airworthiness Regulations, BP35472932.

adoption of EMAR. In the military context, the UK MoD MAA has not fully implemented EMAR and, like the ADF, is still working through the challenges and complexity associated with different single service approaches and requirements. In the civil context[131], France, Italy, Germany, Spain and the United Kingdom are experiencing BREXIT-related friction points and diverse practices when it comes to Parts 66/147.

201. As a result, **we observe** that, although 'civil and military' interoperability is enhanced by DASR relative to earlier TAREGs, there are still overly optimistic expectations in the Defence Aviation community that interoperability will be seamless, or potentially even effortless, under DASR-66/147. Effortless interoperability is not realistic as recognising the training and competencies of external organisations and people will always depend on having appropriate processes, systems, and resources in place to do so. This does not make DASR-66/147 incompatible with the other national and international systems, it just means that repeatable and evolving processes for recognition need to be developed, understood, and resourced.

Adapting for the future

202. Earlier in this report we highlighted the original DGTA intent for a '**moderate** use of EASA regulation' in implementing DASR-66/147, in contrast to the intent for '**maximum** use of EASA regulation' in implementing DASR-145/M/21 (refer Figure 1). These nuanced intentions materialised as distinct implementation strategies to '**adopt**' the EMAR approach to Parts 145/M/21, but to '**adapt**' the EMAR approach to Parts 66/147. The variety in EMAR implementation across international aviation operators that we now observe means few (if any) international military or civil Part 66/147 regulation sets will perfectly match to DASR-66/147 for interoperability purposes. In turn, this means mutual recognition will require a degree of effort regardless of where the second party operator/individual is located. It also eliminates any downside to interoperability from further **adaptation** of DASR-66/147 in the interests of optimising the efficiency and effectiveness of Defence operations. We strongly support **ongoing retention** and, where beneficial, **adaption** of DASR-66/147 to best serve the needs of Defence.

SUMMARY AND RECOMMENDATIONS

Summary

203. The purpose of this Review was to assess the implementation of DASR-66/147 across DASA and the regulated community, confirm the overall value proposition of MAMLs and, where appropriate, make recommendations for improvement. When commissioning the Review, DG DASA recognised that there were a diverse range of perspectives, levels of understanding, implementation progress/success and overall satisfaction with DASR-66/147 across the regulated community.

204. During our Review, we received considerable feedback demonstrating a wide range of experiences and levels of satisfaction with DASR-66/147. As a result, we have identified a number of opportunities to improve overall DASR outcomes for Defence by addressing the observations recorded and implementing the recommendations provided in this report. The following sections summarise our findings in relation to the purpose of the Review, and other key issues listed in the TORs.

Value Proposition of MAMLs

205. We find that MAMLs are a worthwhile and necessary component of any mature, holistic, integrated DASR operating model. DASR-66, DASR-147 and DASR-145 are the three aviation

---

[131] Evaluating the benefit of licencing military aircraft engineers, 15 Jun 20, Evaluating the benefit of licencing military aircraft engineers - GOV.UK (www.gov.uk), BP32466217.

safety regulations that apply to the ADF and Defence Industry workforce working in maintenance organisations to generate military capability. They are part of a socio-technical 'system of systems' which cannot be assessed by, or reduced to, its finite elements. MAMLs are a central characteristic of the DASR system of systems, and are therefore essential to a healthy, deliberately designed, end-to-end DASR operating model.

206. In addition to the centrality of MAMLs in the overall DASR model covering aviation maintenance, they provide a range of benefits compared to the previous TAREG system which did not feature maintenance Licenses. Some of these benefits are:

    a. benchmarking training against an international standard,

    b. a direct and traceable link between training outcomes and certification privileges,

    c. a focused accountability for the certification of maintenance,

    d. a single trade to certify removal & installation of the majority of aircraft components (clarifying 'grey' and 'cross-trade' confusion under TAREG),

    e. greater interoperability, if enabled by people, process, and technology, and

    f. clear scopes of work between B1 and B2 licenses that enable training and workforce design to match aircraft Type-specific maintenance capacity to maintenance demand.

207. We find that the realisation of benefits of MAMLs across the ADF and Industry is directly related to the extent that maintenance workforce trade structures and training have been aligned to the DASR-66/147 model. Where they are closely aligned with MAMLs, DASR-66/147/145/M interact in harmony, as designed, and enable efficient and effective maintenance operations. However, where not aligned, the opposite is true - and MAMLs become an ill-fitting component of a workforce structure / training system that is based on a legacy (non-DASR) model. Our examination of outcomes being realised across different areas of the ADF and Industry clearly demonstrate this relationship and highlights opportunity to better align training and workforce structures to DASR-66 in large parts of the regulated community.

208. Some parts of the ADF and Industry are well advanced in this area and are realising the benefits. These lead organisations offer test cases for other parts of ADF and Industry to follow in ways that suit their specific operating environment.

Ongoing suitability of DASR-66/147

209. The purpose of our review was not to propose revocation of DASR-66 or DASR-147 unless the regulations were found not to be credible or defensible and a more suitable international competency standard was available at an acceptable return on investment for Defence. We did not find any of these conditions to exist. Hence we support retention and increasing alignment to DASR-66/147 as an integral element of a mature, interconnected DASR system.

210. Furthermore, we assess the considerable effort already invested by Defence to implement DASR-66/147 (specifically DASA, the Services and Industry) has provided a framework for realisation of available benefits. Revocation of DASR-66/147 at this point would represent significant waste, and also risk a permanently fractured overall DASR system unable to deliver an increase in aviation safety performance, or potentially deliver worse performance.

211. Revocation would also be an unfortunate outcome for Defence, especially when significant parts are starting to realise the benefits of DASR-66/147 following significant effort already invested to align their training and workforce structures. This Review has identified considerable opportunities to improve and unlock potential benefits of DASR-66/147 and build

on a solid foundation of invested effort to date. Further targeted improvements are required to realise these benefits and will depend on implementing the improvements identified in this Review.

212. Some opportunities include better 'adapting' and using the inter-related DASR-66/147/ 145/M suite, improved education to achieve a common understanding across the regulated communities, and seeking reform of VET delivery of Australian Units of Competence (UoC) that realise a Part 66 licencing outcome. Attention to these opportunities will enable greater realisation of the benefits that full implementation of DASR-66/147 offers, while avoiding the potential dis-benefits that are clearly being felt to varying degrees across the regulated community.

213. Prior to summarising our findings on implementation and opportunities for improvement, we wish to acknowledge the excellent work and due diligence already performed by DASA and the regulated community since the decision for full implementation in 2013. This work has been critical to the progress made to date and will remain so as the DASR system matures towards a steady state. We also wish to thank the many people who participated in our focus groups and, in some cases, provided follow-up feedback, along with DASA staff who have assisted in this review.

DASR-66/147 implementation by DASA

214. Five key themes emerged during our examination of DASA's implementation of DASR-66/147 as follows:

a. Lack of clarity and inconsistency in the use of language in DASR-145 /66 /147,

b. Lack of clarity in DASR-145 and a narrative to differentiate between 'supervising' and 'certifying' maintenance activity,

c. Lack of a wider narrative to relate key new terms introduced by DASR-145/66 to previous well understood maintenance terminology and concepts under TAREGs,

d. Major complexity, delays and inefficiencies with the assessment, initial issue, and update of DASR-66 Licenses (i.e., MAMLs), and

e. Management of Deferred Defects.

Looking at these five themes, we make a range of observations and recommendations aimed at improving the clarity and understanding of DASR-66/147 language and terminology, improving MAML application/issuing workflow and throughput, and improving consistency and efficiency in the management of deferred defects.

215. In addition to the five key themes, two other issues are addressed as follows:

a. Alignment of MAML Exclusions /Inclusions to Maintenance data structures, and

b. The age restriction (21-yo) for 'Certifying staff'.

216. With respect to alignment of MAML Exclusions/Inclusions to Maintenance data structures, we make recommendations to improve alignment between MIL-STD-1808C and the S1000D across all affected ADF platforms. On the age restriction (21-yo) for 'Certifying staff', we recommend it be adjusted, pending legal advice.

217. We have included a number of observations which focus on a need for clearer communication and education on DASR-66/147 requirements and opportunities as well as a need to resource the high level of effort required to manage MAML license assessment and issuance process.

DASR-66/147 implementation by the Services and Industry

218.   Although the TOR title only listed 'DASR-66' implementation in this section, recognising the inter-relationship we also decided to include DASR-147 in our examination of implementation by the Services and Industry. The dominant, and most important theme for examination in this part (per TOR 12b (iii)) was '…*issues and constraints limiting the realisation of benefits as intended by the Air Force Board's deliberate decision in 2013 to introduce DASR66 and DASR147'*. With this focus, six major themes related to areas presenting significant challenges or opportunities for wider exploitation and adoption emerged:

    a.   Recognition of foreign/ex-ADF military maintenance technicians under DASR-66,

    b.   Lack of alignment of IET and some P-IET with DASR-66 requirements,

    c.   Lack of alignment of current aviation trade structures with DASR-66 licenses (particularly Air Force trades, less so with Army and Navy),

    d.   DASR-66 Licenses for Specialist Trades – ARMTECH and ASTTECH,

    e.   DASR-66 Implementation in Navy, Army, and Industry, and

    f.   Status and Maturity of DASR-147 MTOs.

219.   Examination of processes being applied by DASA to recognise foreign/ex-ADF military maintenance technicians eligibility for a DASR-66 License reveal that they have been overly rigid on some occasions with the result that DASR-66/147 implementation, more widely, has been viewed as a strong disincentive and barrier to the recruitment and employment of mature-age experienced technicians, both foreign laterals into the ADF, and ex-ADF and some civilian technicians into Defence Industry. We view this as an 'unintended consequence' of DASR-66/147 implementation and found this to be the most frustrating and disappointing area of focus group feedback during our entire Review. Several case studies were examined looking at a cross section of entry pathways (UK/US/short term/long term) which combined to highlight the need for significant improvements in the understanding, processes and execution for recognition of qualifications and experience of foreign/ex-ADF maintenance technicians.

220.   We make strong recommendations in this area as significant expected benefits from a migration to DASR, being ICAO-compliant and aligned to civil and international regulatory systems, were a major selling point in the Air Force Board decision in 2013. Our observations and recommendations are aimed at improving consistency and repeatability in 'onboarding' foreign trained technicians, better understanding UK MAA processes to streamline onboarding of UK trained technicians, better handling of 'unique' MAML applications from all origins, and better accommodating ex-ADF (pre-DASR-66) technicians (particularly for Industry benefit).

221.   We observed challenges with the **ARMTECH and ASTTECH trades** as they do not neatly fit into the B1/B2 construct. This causes confusion over the scope of ARMTECH and ASTTECH licenses, including complications in issuing a CRS for work performed by these trades. For ARMTECHs, we assess that a Licensing education package delivered at the IET stage, reinforced through ongoing professional development, will assist. For ASTTECHs, we make a recommendation to extend the iMMA approach for ASTTECHs beyond 31 Dec 23 until a mature solution can be developed. This should include consideration, via TNA, of a training model to provide a P-IET pathway for ASTTECHs to achieve a partial Cat-B1 License. Our recommendation for the ASTTECH P-IET B1 License pathway also shows the potential to extend this initiative to include a modularised training pathway for other trades, including core Cat-B1/B2 trades.

222.   We also observed an opportunity to support Industry in their challenge to remove the MAML '**Supervision Exclusion'** (E62), as they do not have access to the ADF Skill Grade 3 training courses that Defence uses to address this exclusion. We have recommended that Air

Command consider options to support Defence Industry MOs to remove E62 Exclusions as an efficiency and productivity measure.

223.   Our research on implementation by the Services and Industry revealed a recent academic Research Project that we consider worthy of consideration by DASA, AFHQ-LOGBR and HQAC. In particular, consideration of the extensive survey responses (around 130) from RAAF technicians impacted by the introduction of MAMLs.

224.   We examined the potential influence of DASR-66 on **remuneration** for technicians and observed that remuneration for supervision (as distinct from certification) in these ranks is independent of MAML possession. Although the LAC/W supervisor pay case took considerable time to reach an outcome, we see the system is functioning.

225.   Examination of DASR-66/147 implementation in **Navy, Army and Industry** revealed greater progress and a more positive outlook towards DASR-66/147 within these groups relative to Air Force who we see as lagging in developing a DASR-66 aligned and optimised workforce design. We observe a variety of reasons, including the greater inertia associated with being a larger organisation in contrast to Navy and Army, as well as greater organisational complexity. The organisational complexity facing Air Force in this endeavour is that responsibility for the three key contributing elements to a successful DASR-66/147 implementation (capability management, training, trade sponsorship) are distributed across three separate areas (Air Command, AFTG, AFHQ). Neither Navy nor Army should be curtailed in their advancement by this lack of alignment.

226.   Looking at **trade structures**, at transition to DASR-66, **Navy** was in a fortuitous position of having their two aviation trades already closely aligned to the intent of DASR. Since DASR-66 transition, **Army** has already invested considerable management effort, time, and funds to transform their training and workforce structure. **Industry** has largely transformed their workforce except for some issues related to their legacy workforce.

227.   Looking at **Navy's** approach to DASR-66 implementation, we observed the value of having greater control of a training system and compliant training devices which has allowed Navy to realise both increased efficiency (two months less time in training) and effectiveness (electrical skills for the Aircraft trade group) in training delivery.

228.   Looking at **Army's** approach to DASR-66 implementation, we make a strong recommendation that appropriate priority and resources be provided to assist AAvnTC in pursuing an existing initiative to establish an RPL process against DASR-66 modules with ADF-wide benefits to streamline the recruitment and training of UK lateral recruits. This was initiated by Army to assist with introduction of the AH64E Apache but has broader applicability across Defence Aviation. Army has also collaborated with RAAFSTT and BAES to develop, trial and implement a fully DASR-aligned IET pathway for Army students at RAAFSTT. This offers a foundation for all Services to tailor DASR-aligned IET to meet their unique needs. We applaud both Army and Navy for their proactive implementation of DASR-66 in different ways driven by Service needs.

229.   Our examination of the **Australian aviation education sector** reveals that the Australian aerospace education system is in a rather entangled and sub-optimal state. To assist, we recommended that DASA, as the aviation Regulator for Defence and Defence Industry (hence complementing CASA in their role), seek to obtain permanent representation and a voice at the national forum - provisionally called the 'Strategic Industry Task Force'. Our engagement with Aviation Australia revealed a potential opportunity to implement an 'examination-based modular pathway' to MAML achievement and/or exclusion removal. On this we recommend a feasibility assessment by DASA.

230.   In examining progress of the **Air Domain MTO**, we observe that HQAFTG has self-assessed a previous lack of DASR-147 knowledge-sharing forums which may have contributed to a divergence in language and a lack of common understanding of the management system for applying DASR related training and accreditation. In August 2023 HQAFTG held their first DASR-147 conference since creation of the Air Domain MTO - we view this as an appropriate and helpful step. On a related matter, we observed some inconsistency in HQAFTG governance of the MTO construct and recommend a HQAFTG review of the construct to examine whether further efficiencies are possible with revisions to the current model.

231.   Our examination of **IET and P-IET** revealed some challenges at RAAFSTT arising from different training programs for RAAF and Army since commencement of the Army DASR-aligned IET program. There are also some misalignments between Cert-II / Cert-IV pathways which are similar to A-MAML / B-MAML pathways, but different enough to create friction and inefficiency when attempting to meet both standards. We also observed a lack of alignment between IET and P-IET training continuums within Air Force. In Army and Navy, the interface between IET and P-IET is well designed and managed, but variance in FEG-led P-IET across Air Force is causing inefficiency and inconsistency. On this, we recommend that the DASR-147 Air Domain MTO (HQAFTG) and the FEGs who deliver Type training be prioritised and resourced commensurate with the agility expected from the training system; if not, FTFs accorded close management to minimise the disruption of being a known training 'choke point' restricting capability. Lastly, we see opportunity to implement the **Army eJournal** that captures both IET and P-IET competencies more broadly across the ADF.

Benefits and detriments of DASR-66 in the international and national contexts

232.   One of the most important observations from this review is that **unlocking the benefits** of DASR-66 in the international context has proven **more challenging than anticipated** prior to implementation. We observe that EMAR is not applied uniformly and discontinuities between different Nations will require on-going effort to achieve anticipated benefits in what is likely to remain a dynamic international environment.

233.   We also observe **overly optimistic expectations** prior to DASR-66 implementation, particularly that international recognition between allies (especially UK/US military) would be seamless, or even effortless. These expectations have not been realised for a variety of reasons, including that the UK/US have not shifted their education system to accommodate EMAR/DASR-66. This does not make DASR-66 incompatible with the UK/US systems, it just means that repeatable processes for assessment need to be developed, understood, and resourced. We make recommendations on this throughout our report.

234.   We see opportunities for Defence to make better use of DASR-66.A.30 provisions with respect to rapid mobilisation and routine supplementation of workforce capacity through employment of 'non-aviation' trades who have undergone lower-level training to perform (not certify) defined tasks. We make a recommendation to pursue this opportunity in ways appropriate to individual FEGs.

235.   In the national context, we identified two **CASA initiatives** with potential to enhance DASR-66/147 outcomes for Defence. The first is a modular self-study pathway to achieving a License which we assess to be worth considering as Defence continues to optimise training pathways to MAMLs. The second was some detailed CASA AMC/GM that defines a 'skilled worker in technical trade' which enables earlier Licensing outcomes with respect to the amount of practical experience required to qualify for a Licence. We recommended that DASA provide comparable GM for DASR-66.A.30(a) to provide greater flexibility for the Services and Industry as they continue to optimise their training and workforce designs to extract the full benefits of DASR-66/147.

Conclusion

236.   We conclude that DASR-66/147 and the associated MAML system are appropriate, and necessary components of a healthy, mature, outcomes-based regulation set for Defence. We note that some aspects of DASR-66/147 are currently imperfect and require targeted further effort by DASA and the regulated community to achieve their full potential benefit through optimised training, licensing and workforce structures. DASA and significant portions of the regulated community have responded admirably to the challenge of implementing DASR-66/147 in the interests of efficient and effective Defence Aviation operations. Considerable work still remains to be done to realise the full benefits, but the collective community is on the right path. Action to address the observations and recommendations in this report will assist in reaching optimal outcomes.

237.   We find that implementation of DASR-66/147 is 'beyond the tipping point' - that is, revocation of DASR-66/147 now, or in the near future would create more disruption, incur more cost, waste much of the significant investment to date, and be conducted without evidence of an alternate bespoke path to generate improved safety and/or operational outcomes for Defence.

Recommendations

238.   The Review Team makes the following Recommendations:

Ser	Para	Recommendation
1	38	We recommend further work by DASA to provide added clarity in DASA products including Fact Sheets, relevant publications including the AFCAMAN, DASR training and promotion material, (and other maintenance management systems), and possibly in DASR AMC or GM.
2	38	We recommend LOGBR (with HQAC AFCAMAN support) develop updated CAMM2 (and other maintenance systems) business rules and functionality to align with contemporary DASR practices and requirements.
3	45	We recommend that DASA give priority to developing an education package supported by DASA products including a Factsheet to provide clarity to the nexus between 'certification' and 'supervision'.
4	49	We recommend that DASA prioritise development and publication of added guidance material to provide a more detailed supporting narrative on DASR-66/147.
5	49	We recommend that LOGBR (with HQAC AFCAMAN support) develop immediate updates to IET, P-IET and Unit training programs to align with contemporary DASR practices and requirements.
6	50	We recommend that DASA review the mature staffing of the DASR-66 team to ensure sufficient resilience to provide uninterrupted capability support.
7	54	We recommend careful examination by DASA of an option to delegate, using DoSA provisions already extant within DASR, some MAML licencing activity.
8	56	We recommend that DASA consider developing a standardised tool on the DPN to enable the regulated community to assess MAML eligibility prior to application for a new/amended MAML.

9	57	We recommend that HQAC-A1/A9 ensure that ERP or other ADF common IT systems deliver the functionality currently provided by the 'local unit spreadsheets' operated by Unit QMs.
10	68	We recommend further work by DASA to provide further details and clarity on expanded Deferred Defect options, including a requirement that appropriate platform-specific 'people competency, process, and data' requirements are defined in relevant CAME, to provide the full flexibility available under M.A.301(a)(2) for aircraft defect deferrals.
11	71	We recommend that CASG, in coordination with HQAC-A9 assess this MIL-STD-1808C / S1000D alignment matrix for wider use.
12	72	We recommend that CASG ensure, during acquisition, that if aircraft maintenance publications and TMP are not based on S1000D aircraft system structures, that a translation matrix is acquired and sustained for in-service use. In short, 'create once, use across many Types'.
13	77	We recommend that DASA seek, as a minimum, legal opinion on the validity of the current age restriction for Cat-A MAML holders and, if no objection to change, revisit the current age restriction with consideration to adjusting the Part 145.A.35(m) 21-year age limit.
14	91	We recommend that AFHQ (LOGBR), Army (AVNCOMD) and Navy (HQFAA) establish generic Service specific processes for the 'on-boarding' of foreign-trained lateral aviation technicians to streamline the process and minimise the administrative delay evident in current practices.
15	94	We recommend that, in support of future use of DASR-GR.80(c) flexibility provisions, FEGs consider the 'blue text' offered in Annex E during their assessment of UK maintainers, who do not hold a DASR-66 MAML, when considering their authorisation as Certifying staff in a DASR-145 MO.
16	100	We recommend consideration by DASA for re-instatement of a provision to 'grandfather' ex-ADF technicians with a profile that, had they applied prior to past expiry of this relaxation in March 2020, they would have been eligible for a MAML.
17	106	We recommend the Authority's next oversight activity of RAAFSTT confirm that IET course material has been fixed by AFTG and delivery reflects current DASR terminology and concepts.
18	112	We strongly recommend further priority action by AFHQ and HQAC staff to address current trade structure, training, and DASR-66/147 alignment issues.
19	117	We recommend that AFHQ (LOGBR), in conjunction with DASA, develop a licensing education package specific to ARMTECH trade scope and authorisation and be delivered during IET so that ARMTECH understand the privileges of their Licence, also that this package be provided for subsequent continuing professional development (refresher training) at Units.
20	119	We recommend extension of the iMMA approach for ASTTECHs beyond 31Dec23 until a mature solution can be developed.
21	123	We recommend that AFHQ-LOGBR consider initiating a Training Needs Analysis (TNA) to examine the most feasible training model to provide a post-IET (P-IET) pathway for ASTTECHs to achieve a partial Cat-B1 License.

22	124	We recommend that DASA provide written guidance on how a MAML could be obtained via a DASR-66 module knowledge and experience assessment approach.
23	128	We recommend that Air Command consider options (with ATSC attendance being one option) to support Defence Industry MOs (that maintain ADF aircraft) to remove E62 Exclusions as an efficiency and productivity measure. This also includes Industry MOs supporting RAN-FAA and Army Aviation. measure. This also includes Industry MOs supporting RAN-FAA and Army Aviation.
24	132	We recommend review of FltLt Fitzgibbon's survey responses by DASA-DCA staff to aid understanding, context and impact of some specific DASR-145/66 implementation issues, recognising that some may already have been subject to updates.
25	133	We recommend relevant AFHQ-LOGBR and HQAC staff also review survey responses to aid understanding, context, and impact of concerns on some specific issues, particularly IET, P-IET, alignment of trade structures, employment practices and remuneration issues.
26	144	We strongly recommend that appropriate priority and resources be provided to AAvnTC to pursue this initiative to establish a RPL process against DASR-66 modules to achieve this worthwhile capability-enhancing activity.
27	147	We recommend that DASA, as the aviation Regulator for Defence and Defence Industry and thereby complimenting CASA in their role, take action to obtain permanent representation and voice at the national forum, provisionally called the 'Strategic Industry Task Force'.
28	150	We recommend that HQ AFTG investigate the feasibility for a DASR-66 Module assessment system (Knowledge exams and Experience log-books) to support P-IET achievement of a MAML or Exclusion removal while continuing to work in posted location if the CASA self-study training and examination pathway is determined to be unsatisfactory for Defence needs.
29	155	We recommend that Capability Managers and CASG implement measures ensure that all future acquisitions include suitable maintenance training aids to allow efficient compliance with DASR-66 Appendix 3 requirements.
30	159	We recommend a review, internal to HQAFTG's Quality Review Committee, of the current MTO construct to examine whether further efficiencies are possible with revisions to the current model.
31	170	We recommend that DASA, AFTG and HQAC-A9 examine the merits of both adopting AFLS processes (or part thereof) within Authority endorsed documents such as the MTOE and HQAC's AFCAMAN, and options for practical training in the context of 'adapting' DASR-147 to better leverage RTO practices, and options for practical training in the context of 'adapting' DASR-147 to better leverage RTO practices.
32	171	We recommend that the DASR-147 Air Domain MTO (HQAFTG) and the FEGs who are delivering Type training be prioritised and resourced commensurate with the agility expected from the training system; if not, FTFs accorded close management to minimise the disruption of being a known training 'choke point' restricting capability.

33	173	We recommend consideration of a Review by AFHQ (LOGBR), in consultation with Army AVNCOMD and Navy FAA, to examine centralised and dispersed options for optimising IET and P-IET delivery for the three Services, recognising the flexibility and multiple career pathways being considered by HQAC-A9 and AFHQ (LOGBR) that, along with Navy and Army career pathways, collectively meet CDF Directive 16/2022.
34	176	We recommend action by HQAC-A9 staff to approve the conduct an initial trial to assess potential efficiencies in process and resources associated with adopting the Army eJournal whereby a single signature can be used to sign-off like tasks across the multiple journals to streamline journal requirements.
35	179	We recommend that LOGBR as a matter of urgency, remediate the identified inadequacies of CAMM2 training.
36	186	We recommend that DASA provide "skilled worker in a technical trade" GM for DASR-66.A.30(a).
37	194	We recommend AFCAMAN promulgate 'best corporate practice' for a CAMO to follow when allotting a State Aircraft into a UK MMO in AFCAMAN Book3, Ch 2, as a standing artefact in satisfaction of AMC DASR-M.201(g)2.

NG Schmidt
Air Vice Marshal
AwB Mentor -Technical

28 November 2023

Annexes:

A. Terms of Reference
B. List of personnel consulted
C. Technical Trades Restructure (TTR) Outcomes
D. Some relevant unfiltered comments from Interviews and Feedback
E. UK Military Maintainers UK MAA Authority Level Authorisations – in an Australian DASR-145 context
F. UK MAA Plans to use Part 66 and 147

BP29526558

TERMS OF REFERENCE: SENIOR EXECUTIVE REVIEW INTO DEFENCE MILITARY AIRCRAFT MAINTENANCE LICENSING AND ASSOCIATED TRAINING: AMDT 1

Resources

1.   The task is estimated to require up to 90 DASA reserve days total. AVM Noel Schmidt is the lead, supported by other available DASA reservist staffs.

Background

2.   The previous technical regulatory system was replaced, inter alia, since it was no longer considered credible and defensible in comparison to internationally accepted aviation safety regulations. The current Defence Aviation Safety Regulations (DASR) for Initial and Continuing Airworthiness have been adopted from European Military Airworthiness Requirements (EMAR) which are hazard based regulations. The final attestation (certificate of release to service), that maintenance ordered/tasked has been properly carried out prior to release to flight, is considered a higher risk activity. The heightened risk associated with certification of maintenance requires greater regulatory control to assure airworthiness.

3.   DASR 66 was introduced in June 2017 and DASR 147 in October 2017, approximately eight and twelve months respectively after DASR 145. DASR 66/147 framework was approved for implementation by the Air Force Board (AFB) as the benchmark for technical competency standards. Although DASA had initially recommended against introduction of DASR 66/147, following both internal and external consultation with other airworthiness authorities, important capability and safety benefits have since become apparent. These include: a direct and consistent link between training outcomes and certification scope; a focused accountability for the certification of maintenance; and enabling a single trade to certify for the removal & installation of most aircraft components (clarifying previous 'grey' and 'cross' trade confusion). The latter of these benefits provides an opportunity for significant workforce and training redesign, with the potential to realise greater flexibility and resilience in the maintenance workforce while linking training effort directly to capability outcomes.

4.   The Defence Education and Training Board considered options, in November 2017, for the implementation of DASR 147 and approved an implementation strategy for a single Defence Maintenance Training Organisation (MTO) with Commander Air Force Training Group (AFTG) as the Accountable Manager. The single tri-service 'Air Domain' MTO was established in December 2018. Four independent defence industry MTOs have since been approved, but only for aircraft type training and only when this training is exclusively provided to defence industry personnel.

5.   Upon DASR 66 introduction, transitional arrangements were put in place that allowed the continued use of legacy maintenance authorisations and also allowed for some latitude in the evidence required to gain a Military Aircraft Maintenance Licence (MAML). Transitional arrangements ended in March 2020.

6.   A DASR 66 MAML is issued when appropriate evidence of both basic knowledge and experience requirements, has been provided. A MAML can then be used on an aircraft type once an approved aircraft type rating has been completed. DASR 66 knowledge and experience requirements are largely aligned to Aeroskills training conducted in accordance with the national Vocation Education and Training (VET) system; a competency based training model. DASA utilised Civil Aviation Safety Authority (CASA) mapping of VET Units of Competency (UoCs), which had been endorsed by the European Union Aviation Safety Agency (EASA), to map ADF

training to DASR 66 knowledge modules. The ADF technical training regime has largely remained unchanged and is therefore not fully harmonised with DASR 66 requirements. Gaps in basic knowledge requirements are aligned to MAML exclusions that are mostly aircraft system based (e.g. propulsion systems, electrical systems, etc) and preclude certification of maintenance on those systems. Gap training costs time and money and some of this training is sometimes also perceived by the regulated community as having low value for effort.

7.   As the Services are struggling to achieve recruitment and retention targets, coupled with higher demands for aircraft maintainers on new and complex aircraft, some of the requirements that DASR 66 imposes has led to considerable negativity and misunderstanding of DASR 66 and its implementation. Some of this DASR 66 narrative does not appear to consider the whole system, available evidence, and the impact/consequences of diverging from the current DASR 66 trajectory. When coupled with the right workforce and training system, DASR 66 has been shown to work effectively and efficiently in profit driven civil contexts.

8.   Exacerbating frustrations in the regulated community is the fact that almost all maintainers trained in the United States of America (US) or United Kingdom (UK) are currently unable to obtain a MAML without completing an extensive and time consuming list of examinations via CASA approved 147 MTOs. There is also no current Recognition of Prior Learning (RPL) / Recognition of Current Competency (RCC) process for DASR 66 via the ADF DASR 147 MTO. To enable capability, several Military Air Operators (MAOs) have sought to utilise flexibility provisions under DASR GR.80 and authorise certifying staff <u>without</u> a MAML. This flexibility may include circumstances where the foreign trained maintainer had previously been authorised to certify maintenance in another EMAR 145 compliant Maintenance Organisation (MO) but has no recognisable maintenance licence. Risk needs to be held by the relevant MAO when authorising certifying staff without a MAML, with DASR 66 providing the benchmark for return to compliance.

9.   Conversely, some in the regulated community, including defence industry, have expressed a desire to exploit the inherent flexibilities of DASRs and employ larger numbers of non-licence holders to increase maintenance capacity in their DASR 145 MO (including the potential employment of cadets and reservists). Similarly, some of these organisations are exploring the efficiencies of using CASA approved 147 MTOs, which can apparently provide a higher trained maintainer, more quickly and cheaply than Defence's current joint technical training system.

Purpose

10.   In the spirit of continuous improvement, the purpose of this task is to review DASA's and the regulated community's implementation of DASR 66/147. The task is expected to confirm the overall value proposition of MAMLs, and make recommendations for improvement. It should consider opportunities for DASR 66/147 maturation in the Defence context including potential opportunities for maintenance workforce and training improvements.

11.   The purpose of the review is not to propose revocation of DASR 66 or DASR 147 unless:

a.   there is a compelling argument that the current regulations are not credible and defensible within the Australian context; and

b.   a more suitable international competency standard is available, and the effort/risk to migrate Defence and Defence Industry to the new competency standard is balanced by an expected increase in aviation safety performance.

Scope

12.   The task is to include a review of:

a.   DASR 66/147 implementation by **DASA** including:

  i.   credibility and defensibility of the DASA MAML including any risks/constraints to a credible and defensible defence maintenance licensing system;

  ii.   DASR flexibility provisions to support the 'Release to Service' certification without a MAML;

  iii.   MAML exclusions and inclusions;

  iv.   mapping of existing ADF training to DASR 66 requirements;

  v.   experiential pathways to a MAML;

  vi.   resources and processes for issuing MAMLs as well as evolving licensing policy;

  vii.   the promotion and training of DASR 66/147;

  viii. maintenance licensing recognition;

  ix.   the age limitation imposed on certifying staff – 21yo and over;

  x.   the necessary linkages with CASA to enable seamless recognition, alignment and interaction of CASR 66/147 and DASR 66/147 organisations to provide a resilient and responsive Australian aviation sector; and

  xi.   the necessary linkages with US and UK Military Airworthiness Authorities to enable seamless recognition (AUKUS), alignment and interaction of their maintenance accreditation and trade training organisations with DASR 66 and DASR147 MTOs to provide a resilient and responsive combined aviation sector.

b.   DASR 66 implementation by the **Services and Defence Industry** including:

  i.   maintenance training design and delivery by Defence's DASR 147 MTO;

  ii.   policy/practice regarding RCC / RPL by Defence's DASR 147 MTO;

  iii.   the need to increase throughput of trained force through IET (both quantity and speed) due to retention and growth of the ADF maintenance workforce;

  iv.   workforce design, mobility and skill based remuneration;

  v.   issues and constraints limiting the realisation of benefits as intended by the Air Force Board's deliberate decision in 2013 to introduce DASR66 and DASR147; and

  vi.   contemporary maintenance training and assessments conducted in the Australian civil sector.

c.   The overall benefits and detriments of DASR 66 in the international and national contexts, including recognition and alignment to other National Aviation Authorities and National Military Aviation Authorities.

Conduct

13.   The review is to commence in Mar 2023 and include, but not be limited, by the following inputs:

a.   Airworthiness Board (AwB) outcomes relating to maintenance licensing.

b.   DASA development of DASR 66 and approach to aircraft maintenance licensing.

c.   The regulated community (Services and Defence Industry) implementation of DASR 66, including the IET training construct and implementation of the DASR 147 MTO.

d.   Air Force, Army and Navy Aviation Maintenance Concept of Employment reviews.

e.   Novel approaches and lessons learned from defence industry and civil aircraft maintenance licensing.

14.   With respect to this review, recommendations are requested against the individual scope elements and on the following:

a.   Continued alignment of DASR to EMAR 66/147 cognisant of the mandate in Joint Directive 21/2021 Defence Aviation Safety Framework.

b.   Opportunities for improvement in the implementation of DASR 66.

c.   Potential opportunities for the Services and Defence Industry when adapting to DASR 66.

d.   Agreements and alignment with CASA to encourage the efficiencies of a single aviation sector in Australia.

Deliverables

15.   Deliverables are:

a.   The reviewer is to provide any comments or proposed amendments to the review scope or conduct prior to 31 Mar 2023.

b.   Preliminary review of findings (*by 31 May 23*) to support a status update to the Defence Aviation Safety Board and underpin a facilitated discussion at the Jun 23 AwB convocation

c.   Provision of a draft report (by *31 Aug 23*) to support socialisation with key Defence stakeholders

d.   Final report (by *13 Oct 23*) for presentation at the Nov 23 DASB and Dec 23 AwB convocation.

e.   Periodic face-to-face/remote discussions (as agreed).

Consultation

16.   The following were engaged during development of this TOR: LOGBR-AF, AVNCOMD (CAM), FAA (CAM), Industry (DARICC), and AFTG (Director Learning Systems).

Communications

17.   The primary DASA POC is CAPT Peter Carter, RAN (peter.carter@defence.gov.au) supported by LTCOL Gary Lamont (gary.lamont@defence.gov.au) .

joseph.medved
2023.02.20 15:51:32
+11'00'

JJ Medved
AIRCDRE
DG DASA

Feb 23

List of personnel consulted

Defence Aviation Safety Authority: 26-28Apr23
AIRCDRE Joe Medved
CMDR Mark McGuiness
LTCOL Gary Lamont
FLTLT Curtis McAlister
WOFF Sean Larkin
Mr David Edwards
Mr Charles Galea
Mr Emmanual Spiteri

Headquarters Air Command and **Logistics Branch –Air Force** – 2 May 23
GPCAPT Chris Dunstan
GPCAPT Greg Lamb

Army – **Aviation Command** – 22 May 23
COL Adam Kurylewski [HQ AVNCOMD]
CMDR Craig Lavers [HQ AVNCOMD]
LTCOL Timothy Byrne [HQ AVNCOMD]
LTCOL Chris Porada [HQ 16 AVN BDE]
Mr Heath Smith
MAJ Karl Jilg [AAvnTC]
WO1 Kent Herrmann [HQ AVNCOMD]
WO1 Paul Vandermeer [HQ 16 AVN BDE]
Mr David Howard [HQ 16 AVN BDE]

Air Combat Group – 23 May 23
WGCDR Jon Jorgensen [HQ 82 WG]
SQNLDR Ryan Hardman [1 SQN]
FLTLT Rob Ettles [HQ 82 WG]
WOFF David Hooper [6 SQN]
WOFF Rod Knight [HQ 82 WG]
WOFF Chris Panzram [1 SQN]
FSGT Don Bacon [HQ CSG]
FSGT Joel Fallows [6 SQN]
SGT Jade Burke [6 SQN]
SGT Matthew Glenn [HQ 82 WG]
CPL Kallen Bell [HQ 82 WG]
CPL Stuart Greaves [1 SQN]
CPL Nathan Tyzack [1 SQN]

Air Mobility Group
WGCDR Timothy Cantrill HQ [86 WG]
SQNLDR Stephen Bell [33 SQN]
SQNLDR Konstantin Jensen [35 SQN]
WOFF David Schunemann [36 SQN]
WOFF Mark Taylor [33 SQN]
FSGT Davis Cumming [35 SQN]
FSGT Bevan Drew [36 SQN]
FSGT Ludovico Lico [33 SQN]
CPL Damien Barbir [36 SQN]
Mr Nathan Whitley [HQ AMG]

Boeing Defence Australia and **Northrop Grumman**
Mr Brett Reibel [BDA]
Mr Matt Phillips [NG]
Mr Puil Suortis [NG]
Mr Lee Wagner [BDA]

Aircraft Maintenance Training Organisations
FLTLT Rob Ettles [HQ 82 WG]
SGT Dallas Young [35 Sqn]
Mr Kaden Costal [NG]
Mr Trevor Ryan [NG]

Aviation Australia – 24 May 23
Mr Gordon Brown
Mr Bill Horrocks
Mr Russel Quinn
Mr Leif Mawson

Surveillance and Reconnaissance Group [and opening] - 18 Jul 23
GPCAPT Jason Dean [HQ ACG]
WGCDR Phil Irvine [HQ SRG]
WGCDR Jon Jorgensen [HQ ACG]
WGCDR D Keoek [HQ SRG]
WGCDR Sally Taghaode [HA ACG]
WGCDR Janeter Turnbull [HQ ACG]
SQNLDR Cook [HQ ACG]
SQNLDR Harvey [2 SQN]
SQNLDR D Price [HQ SRG]
SQNLDR P Wall [11 SQN]
WOFF Stephen Clark [11 SQN]
WOFF Stan Davis [42 WG]
WOFF M Donnelly [2 SQN]
WOFF Nast [HQ ACG]
WOFF Neil [HQ ACG]
FSGT Bradley [2 SQN]
FSGT Adam Dunscombe [11 SQN]
FSGT Goff [2 SQN]
SGT M Arnold [2 SQN]
SGT D Bennett [2 SQN]
SGT Moore [HQ SRG]
SGT M Redman [2 SQN]
CPL H Blake [2 SQN]
CPL Connolly [2 SQN]
CPL A Fowler [2 SQN]
Mr C Labra [HQ SRG]

Air Combat Group
GPCAPT Jason Dean [HQ ACG]
WGCDR Phil Irvine [HQ SRG]

WGCDR Jon Jorgensen [HQ ACG]
WGCDR Sally Taghaode [HQ ACG]
SQNLDR Cook [HQ ACG]
SQNLDR Harvey [2 SQN]
SQNLDR Hinchcliffe [77 SQN]
SQNLDR D Price [HQ SRG]
SQNLDR McIntyre [3 SQN]
FLTLT Bell [77 SQN]
FLTLT Chris Henderson [2 OCU]
WOFF Tony Beer [77 SQN]
WOFF M Donnelly [2 SQN]
WOFF Nest [3 SQN]
WOFF Neil [HQ ACG]
FSGT Bradley [2 SQN]
FSGT Garner [3 SQN]
FSGT Goff [2 SQN]
FSGT G Hill [77 SQN]
FSGT David Poole [3 SQN]
FSGT Tony Richardson [77 SQN]
SGT Stephen Fisher [77 SQN]
SGT Moore [HQ SRG]
CPL Simon Campbell [2 OCU]
CPL Andrew Johnson [3 SQN]
CPL Vikas Kaushal [77 SQN]
CPL Darren Moulton [3 SQN]
CPL Dylan Piggott [3 SQN]
Mr C Labra [HQ SRG]

Combined 147 and Training
WGCDR Phil Irvine [HQ SRG]
WGCDR D Keoek [HQ SRG]
WGCDR Will Trott [HQ 42 WG]
WGCDR Janeter Turnbull [HQ ACG]
SQNLDR Daniel Price [HQ SRG]
FLTLT Chris Henderson [2 OCU]
WOFF Stephen Clark [11 SQN]
WOFF Stan Davis [42 WG]
WOFF Nast [HQ ACG]
WOFF Neil [HQ ACG]
FSGT Bradley [2 SQN]
FSGT Adam Dunscombe [11 SQN]
FSGT Daryl Gracie [ACSPO]
FSGT Ryan Hodgson [2 OCU ITC]
SGT Moore [HQ SRG]
CPL A Fowler [2 SQN]
Mr Dean Boulton [LMA]
Mr Chris Dare [BDA]
Mr Harley Doughty [ACSPO]
Mr Daniel Duff [BDA]
Mr Kevin Green [HQ SRG]
Mr Jesse Heaton [BAE]
Mr Greg Hickman [BDA]
Mr Loosemore [LMA]
Mr Jarod Moss [BAE]
Mr Shawn Smith [LMA]

Defence Industry
WGCDR Phil Irvine [HQ SRG]
WGCDR D Keoek [HQ SRG]
WGCDR Janeter Turnbull [HQ ACG]
SQNLDR Cook [HQ ACG]
SQNLDR D Price [HQ SRG]
SQNLDR Chris Stade [HQ ACG]
WOFF Stan Davis [42 WG]
FSGT Ryan Hodgson [2 OCU ITC]
SGT Moore [HQ SRG]
Mr Dean Boulton [LMA]
Mr Jasom Burton [BAE]
Mr Jesse Heaton [BAE]
Mr Ben Jacobs [BAE]Dale Ludlow [BAE]
Tony McDermott [BAE]
Mr Loosemore [LMA]
Mr Jarod Moss [BAE]
Mr Shawn Smith [LMA]
Mr Nev Wamsley [BAE]

Fleet Air Arm - 19 Jul 23
CAPT Chris Clyde [DAE CAM]
CMDR Alex Binns [HQ-FAA Part M+145 QM]
LCDR David Carriage [TA-AVN M-TT]
LCDR Anthony McGann [HQ-FAA]
LEUT Harry Charalambous [HQ-FAA CAMO Part M Desk]
LEUT Kiara Penman [816 SQN DAEO (Quality)]
WO Garry Lum [725 SQN AAEO]
CPO Joseph Glasson [725 SQN QSO]
CPO Ashley Hoogwerf [TA-AVN CMC Mgr]
PO Carmen Watson [725 SQN POATV (Shared Services)]
LS Jayden Brien [725 SQN QO]
LS Cameron Cornell [725 SQN MS]
Mr Michael Edwards [SAAL]
Mr Derrick O'Reilly [SAAL]
Mr Scott Romeo [BDA 723 SQN RM]
Mr Jamie Turner BDA 723 SQN QM]

Air Force Training Group - 19 Sep 23
AIRCDRE David Strong [HQAFTG]
GPCAPT Lloyd Sellick [HQAFTG]
GPCAPT Paul Webb [HQAFTG]
Ms Bev Doyle [HQAFTG]
Mr Adrian Xavier [HQAFTG]

RAAF School of Technical Training and BAE Systems – 20 Sep 23
WGCDR Gary Simmonds [RAAFSTT]
SQNLDR Kirk Cartwright [RAAFSTT]
SQNLDR George Murtagh [HQGA]
FLTLT Neil Pinker [HQGA]
Ms Taricia Davies [HQGA]
Mr Marty Roberts [BAES]
Mrs Sandy Webster [HQAFTG]

Technical Trades Restructure (TTR) Outcomes

Extracts from the final TTR implementation Project Final Report [132]

…The last major change to the aviation technical trade structure occurred in 1992 with the Technical Trades Restructure (TTR). This followed recommendations from the Technical Trade Structure Review Working Party which concluded, in July 1990, that the existing aircraft engineering trades structure was seriously deficient and lacked the flexibility necessary to cope effectively with the breadth of changing technology accompanying new aircraft introductions. It also inhibited the optimum productivity from the aircraft technical workforce.

… The Technical Trade Structure Review Working Party examined in detail both aircraft technical workforce and ground engineering trades. The Working Party concluded that, by restructuring along recommended lines, the RAAF would have a wider recruiting base, significant productivity gains, and a smarter and more efficient workforce with a more cost-effective training system. It also concluded that the aircraft engineering trades structure was so deficient that revising the structure, combined with personnel management initiatives aimed at improving average experience levels, could yield a 20 percent gain in productivity amounting to a saving of 1048 positions.

…Prior to TTR Air Force had **six large aviation trades** Airframe, Engines, Electrical, Radio, Instrument, and Armament. These trades were **amalgamated into two trades** - **Avionics** (Electrical, Instrument, Radio) and **Aircraft** (Engines and Airframe). In addition, aircraft welders and metal workers/machinists became **Aircraft Structural Fitters**. Coupled with self-certification for selected CPLs and SGTs and platform-streaming that aimed to increase on-type experience to an average of 5 years, TTR was intended to deliver a 20% lift in productivity. This proposed productivity increase was matched by a goal of a 20% reduction in establishment that was to be implemented via an initial 5% reduction in post-TTR establishment and further reductions over a five-year implementation period. Apart from the initial 5%, actual workforce reductions are not known.

… TTR also introduced multiple skill levels of Mechanic, Fitter, Technician, Advanced Technician and Systems Technician.

… TTR also included the concept of Self Supervising Technicians (SSTs). The employment of SSTs parallels that of civil LAMEs in the airline environment with employment on the maintenance of complete aircraft and engine systems.

…A decision was taken at the outset of TTR to use the CAA (now CASA) Category Technical Competency (CTC) Examination system as a major part of the qualifying process for SSTs. In doing so the RAAF adopted a tried and proven system and was saved the effort and cost of developing its own exanimation system. The added attraction for the individual was that this process put them in a position whereby they only needed to sit the CASA Airworthiness Administration Examination to qualify for a basic civil LAME licence.

…However, the employment of SSTs proved restrictive and difficult to manage. To become an SST under the original system, the applicant first sat for and passed the CASA CTC exanimations for the particular trade in which they were qualified and experienced.   As TTR introduced the trades of **Aircraft** and **Avionic** to cover multiple musterings, the SST was therefore licenced in the pre-TTR role. This resulted in an artificial restriction to employment. Additionally, the failure rate of applicants sitting the CTC examinations was in the order of 50 percent. Further, many units deleted SGT SSTs from their establishment tables as their employment on hands-on work restricted the rotation and use of SGTs in

---

[132] TTR Implementation Project Final Report, BP35472942.

management roles. The issuing of further SST licences was deferred until completion of a CASA review into LAME licencing which is now underway.

… The National Aeroskills Project (NASP) is a tri-partite industry body formed to rationalise training across the entire Australian Aerospace Industry. The ADF is represented by HTTRT. The project is recognised by the Australian National Training Authority (ANTA) as the Competency Standards Body for the industry, and the RAAF and RAN have been very active in the development of the competency standards for the aerospace industry.

…A National Aerospace Curriculum (NAC) has been developed by the NASP and is now being delivered by all TAFEs across the country. The RAAF adopted the draft version in 1992 and has been delivering that, together with specific RAAF modules, since the introduction of TTR. The RAAF is now repackaging the delivery of aerospace training to incorporate the approved 1995 version of the curriculum being delivered by TAFEs. This means that RAAF tradespeople will complete the identical course modules leading to civilian Aircraft Maintenance Engineer (AME) status and their training will be recognised by civil industry. It must be understood that the industry compromises within the NAC will mean that a small percentage of training.

… In line with the National Training Reform Agenda, training outcomes within an industry across the nation are to be specified in terms of core and elective competencies common to all members of the trade. The NASP has developed **Competency Standards** applicable to the **Aircraft**, **Avionic** and **Aircraft Structures** trades but due to resource implications, the RAAF has not yet accepted this competency assessment system for use.

… The NASP has developed a **Journal** for the recording of competencies completed. The introduction of this system into the RAAF will require a review of instructions and specifications to detail the methods of competency assessments. Competency assessments and the methodology for completion of the Journal is included in the Occupational Specifications, and assessor training and appointment is detailed in a DI (AF) LOG instruction. The competency assessment system provides an audit trail for task authorisations by SENGOs and leads to civil trade recognition by civilian industry.

.. TTR initiatives to widen the recruiting base were multi-faceted. The educational requirements were lowered although the aptitude requirements remained substantially unaltered. These changes reflect the need to adapt Service requirements to the changing nature of the products of the school system. Enhanced Conditions of Service included a more rapid progression onto adult rates of pay, a minimised period of unproductive initial employment, recruitment direct to trade, increased degree of influence over future career/employment prospects and a clearly defined career structure. Additionally, alignment to the national training standard in aerospace and an objective method to provide RPL has facilitated lateral recruitment and fast tracking of individuals (as required) to an extent not previously possible.

… The introduction of modularised training delivered via distance learning provides a mechanism to "tailor" training to specific workplace (or individuals) needs. This capability minimises overheads associated with maintaining a trained workforce while providing a facility to change the training baseline at short notice with minimal on-costs.

… Post-trade training including NDI, Advanced Certificate and Associate Diploma SYSTECH courses provide a means to train selected individuals beyond trade level as required to meet workplace need. This capability minimises the tendency for a general "creep" in the training delivered to the trade level workforce as a whole.

… Productivity optimisation measures include creation and maintenance of a cost-effective training system, maximisation of experience levels on-type, multi-skilling, the alignment of skill levels with employment, removal of unnecessary demarcation barriers and changed supervision requirements for selected types of maintenance activities.

… Changed supervision requirements included the introduction of SST employment and the creation of "competent tradespeople". Both initiatives have a direct impact on the per capita cost to complete a maintenance task, although any direct productivity gains from SST employment are difficult to quantify.

… Multi-skilling is now beginning to be effectively used within Units but, coupled with the more flexible regulatory regime and flexible training system, will continue to deliver considerably more productivity benefits for some time, especially as employment and rotation plans are more rigorously developed/refined.

… The TTR training system was designed to meet several discrete objectives. It needs to be adaptable to changing needs in terms of technology .and student throughput for the foreseeable future. Additionally, it is required to provide the flexibility to meet RAAF needs in times of peace and conflict, and facilitate training delivery to meet a wide range of workplace requirements. The system is also required to be cost effective while achieving these goals. The system adopted provides for just-in-time training delivery according to workplace need and employs self-paced distance learning techniques using multi-media courseware delivery. The cost-effectiveness needs to accommodate all of the target criteria in the assessment process although the relative value of each is not defined. The cost to run this system is currently significantly less than the pre-TTR school-based delivery.

… However, the most concrete proof of the new TTR training system is that it has reduced training failure rates from > 15% to < 2%. It is highly likely that further refinement of tutoring methods and courseware, in addition to more extensive use of computer-aided-instruction will further enhance this figure.

…Although the new training system could not yet be considered to be mature, there is strong evidence that it produces a higher percentage of graduates at the required standard per trainee input. It achieves this at lower cost than pre-ITR and provides a range of tangible benefits such as increased flexibility and adaptability, the ability to more readily provide RPL, facilitation of fast-tracking when necessary and provision of scope for refresher training/testing if required.

… A major task confronting the TIR Implementation Team was the restructuring of aerospace training. The accepted method of straight through apprentice and adult training at Wagga has been replaced by a distance learning system which was totally foreign to the technical workforce at the time. Skill levels of Mechanic, Fitter and Technician have been introduced and TDLFs have been established at bases.

…Courseware has been restructured in line with a draft civilian curriculum with RAAF specific modules added. The concept of distance learning has proven very successful. With recruiting direct to trade, recruiting levels are consistently being met. Prior to TTR, recruiting levels could not be sustained. The trainees are now employable and productive in a shorter time with less instructor overheads, and the system has the flexibility to ramp up or down according to recruiting requirements.

…Explosive Ordnance. The old "gunnie" empire has been a strong objector to TTR initiatives. The reasons given to retain the old trade and employment boundaries still are safety issues. The claim was that the empire could not be broken up because the experience levels would drop to such an extent that safety would be compromised. To substantiate the claims being made, DGLOG-AF commissioned a review of explosive ordnance related activities. The review team concluded that a number of tasks that are not EO related could be safely transferred to other trades, and only personnel who actually work on EO need the prerequisite training. Pre-TTR, all ARMFITT personnel were trained on EO, but the majority of work at unit level was systems related and did not require specialist EO training. The review team concluded that EO handling can, and should be undertaken, by Aircraft and Avionic tradespeople who have been appropriately trained on safety aspects. Only those actually employed on EO maintenance require the specialist EO courses. This was the intent of TTR with respect to EO, and the review team findings supported the TTR concept. The only location where the EO related initiatives have truly been tested is at Williamtown where, as a result of Executive direction, the 481 WG Armament Section has been substantially "dismantled". Flow-on effects in flying units at Williamtown and growing acceptance that there is merit in the TTR proposals.

Some relevant unfiltered comments from Interviews and Feedback

1.   As noted in the report, the Review Team conducted a number of focus group sessions and interviews with numerous FEG CAMO and DASR-145 Maintenance Organisation (MO) staff (both ADF and Industry) as well as DASR-147 Maintenance Training Organisation (MTO) staff. Feedback included many raw and unfiltered comments which reflected significant frustration and a feeling of disempowerment across large areas of the maintenance workforce.

2.   Interestingly the majority of negative feedback with implementation of DASR-66 licensing came from the Air Force maintenance workforce. Both Army and Navy maintenance workforces appear much less impacted because of strong leadership particularly to address IET misalignments and deficiencies as well as providing a clearer narrative in which new DASR-66 terminology is applied in daily maintenance practices.

3.   Nevertheless, we thought it useful to record some unfiltered comments/feedback that we received in both focus sessions and written follow-up material. Links to some comments are provided where they a part of larger written submissions. Feedback below is presented without any detailed analysis here. However, we have attempted to address issues raised with added contextualisation, analysis and recommendations where appropriate, in our core report above.

4.   An overarching observation was made by ACG WOFF:

General workforce observations advise DASR 66 as a clunky, doesn't quite fit, inefficient and in some ways more prescriptive framework than TAREGs ever were. Six years on and we remain faced with delays in obtaining licenses, restrictions in work scope not previously encountered, diminishing ability to use a portion of our Reservist workforce, restrictions and challenges to allied force interoperability, lateral recruitment challenges, and the prospect of a future post-IET training burden.

Examples of work scope exclusions lie in ARMTECH and ATECH B1 licence exclusions e.g. Unlike their civilian counterparts, our ATECH B1s cannot perform basic electrical work (e.g. Battery reconnects) because they have a licence exclusion. Having this exclusion removed would allow for maintenance efficiencies through not depending on an additional trade for the task. These tasks cannot be alternatively task authorised due to the licence exclusion.

Further training is required to remove the exclusion – a considerable impost to the workforce. Under TAREGs, task authorisation was permissible.

When we look to our future through the eyes of Agility, Readiness and force interoperability DASR 66 does not appear to be there to support[133]

On DASR and DASR-66 implementation:

5.   FltLt (ex-FSgt) Fitzgibbon's Undergrad Research Report (refer paras 128-132) included a Survey circulated in late 2022 to many members of the Air Force maintenance workforce. The survey sought feedback via a number of target questions related to aviation technicians perceptions on the transition from TAREGs to DASR and the need for MAMLs. He received over 130 responses from a wide cross-section of both FEGs and Enlisted ranks – split around 30% WOFF to SGT and the remaining 70% SPL and below. Survey responses provided some interesting insights into training at RAAFSTT, system change, Cat-B Licence holders and workforce retention. Some of the more noteworthy comments are included below:

---

[133] 230726 -Email -ACG WOFF -Some Issues (incl Lateral Transfer), BP35472926.

On RAAFSTT

…RAAFSTT were still teaching TAREG/ 059 information until recently … No information was ever provided with regards to current licencing in RAAF … All instructors had no knowledge of how system works … Everything was taught with 'trade supervisor' mentality …. Training at Wagga is very dated and most of it was TAREGS when I went through … then posted to a unit and was told to 'forget it, and learn DASR'.

On System Change

…MAMLs have not improved anything over TAR authorisation. They have only added a layer of administration and complexity to the previous system. The requirement for all B licence holders to supervise contradicts with rank structure that requires a member to be a CPL to supervise. Rank was previously linked to maintenance authorisations which worked for our system and served us well prior to the introduction of the DASRs. DASR MAMLs are generally poorly understood and implemented varyingly dependent upon the unit.

…The process of licencing and authorisation has been greatly mismanaged by RAAF when MAML was rolled out. Whilst the best of intentions was there to align the organisation to the rest of the aviation industry, the support systems (CAMM2) has been too far behind to support the changes. This has led to multiple admin errors.

…We have adopted a licencing system that is not compatible with the transient nature of the ADF workforce. We need to authorise our people prior to them being ready due to the turnover of employees at the LAC/CPL level. The root cause of the issues we see are due to losing experience in a yearly posting cycle, whereby it takes minimum six months to have people licenced but years to get them to the level of the person that was lost to another platform. Flow on effects have been a heavy reliance on LAC/W's who are not valued and have a number of options with other employers, mostly defence contractors, who are willing to take them on. I believe this issue is greater than the licencing issue itself and has been largely ignored for the best part of a decade, even before DASR came into effect.

…Posting cycles greatly affect the level of experienced B class MAML holders. A class MAML's are slowly being used effectively.

…The Air Force transition to DASR 66 reg has introduced issues along the way and not being managed by command very well. A lot of flexibility has been removed from the the old regs to DASR 66 and not in the best interest of Air force to achieve a capability. Work with our major defence partners (USA and UK) has introduced restriction to enable maintenance workforce across AUS, UK and USA maintain common aircraft.

…Having worked in a few 145 MOs under CASA, NZCAA, FAA regulatory framework. DASR has been poorly implemented with a lot of hang-over ways from the TAREG / .059 / DGTA era. A shining example of a very inefficient & waste of maintenance manpower resources, is the requirement to still need LAMEs/AMEs (i avoid the term techo's) to accompany an aircraft if it plans to land away-base. AMG Units could benefit with huge efficiency gains using a more airline than ACG approach, to how they do business.

…Single sign capacity should be used much more effectively. There is currently a culture of 'holding hands to do a task' when really the task could be completed with less people. Additionally, operational tempo and deployments are very high and placing increased pressure on the workforce.

On Category B Licence Workforce

…Units should not require a large amount of B MAML holders if they are utilised correctly similarly to LAME's under CASA. However due to Operational requirements it is necessary to have a B1 and a B2

per shift on a deployment as well as supporting home base Operations. However, our Tradespersons and MAML holders are inexperienced across the board which is the issue. More education on how to best utilise personnel under the DASR 66 is required.

… we cannot use our Licence Holders effectively. Ineffective fitter training and Types Courses, poor management of junior technicians and a lack of continuity within the unit results in an inability to utilise a B-MAML Holder the way it's intended. Also, a lack of complex tasks simply due to the nature of the airframe and its reliability results in a junior workforce with very little exposure to more than minor scheduled maintenance and basic rectifications of mission systems. Hence, a lot of the time BMAML Holders can't supervise multiple tasks at once due to the training burden of the TSO under their control, or in the case of a complex task, the fact that they have probably never even done the job themselves.

…We are barely making do at the moment. We almost always have one aircraft deployed, which takes 2 B1 and 2 B2 away from the workforce. This leaves only 1 or 2 of each type per shift. When standby crews are programmed, this makes it difficult for B MAMLs to apply for leave or courses. Then we have the bulk discharges to deal with.

… The entire workforce flow and positions needed to be re-designated instead of forcing how it was previously done into DASR.

On Retention

…We are losing our B class MAML holders faster than we can train them. Most are leaving to work for commercial industry and Defence partners who recruit specifically looking for Defence personnel. One of ours filled in an EOI on a website and had a job offer the next day. LAC B license holders are offered a significant pay increase to work with civilian employers utilising their unique skillset. Defence currently has no incentives in place to retain our people, therefore many are leaving shortly after achieving their B MAML license authorisation. Promotion prospects and locational stability are also contributing factors to discharge rates. Retention benefits, pay increase and promotion should all be considered for MAML holders.

…We need to get paid according to our authorisations, look at every civilian maintenance organisation. Nowhere else does a brand new technician get paid the same as an experienced B class with every authorisation that they can possibly get at their rank level. It's obviously not working in Defence which is shown by the amount of LAC/CPL B class discharging whilst SGT and above discharge rates stay low comparatively.

.

UK Military Maintainers

UK MAA Authority Level Authorisations - in an Australian DASR-145 Context

1.   Following is an examination of key elements of the UK Ministry of Defence (MoD) airworthiness system defined by the UK Military Aviation Authority (MAA) as related to 'certification of aircraft maintenance'. It includes a comparison against the Australian system under DASR-145 with the aim of assisting our understanding UK military aircraft maintainers.

2.   The UK MoD has a credible and defensible airworthiness system for generating serviceable aircraft from their contracted Part 145 Approved Maintenance Organisations (AMO)[134]. Examination of MAA documents shows that the UK MoD appears to have a credible and defensible airworthiness system for aircraft maintenance authorisations. The UK 'system' includes RAF, RN and British Army maintainers trained, experienced, assessed and authorised to conduct 'Certification of Maintenance' within their respective Military Maintenance Organisation (MMO) – the term that UK applies to a similar Australian DASR-145 organisation - that has similarities with the certifying staff authorised IAW DASR.

3.   UK MMOs work to a 'Base Maintenance' construct[135] - similar to 'Base' maintenance under DASR-145. Importantly, only a single 'Certificate of Release to Service' (CRS) is conducted/issued at the conclusion of all maintenance - specified as follows:

(1) *The 'Certification of Air System Release'* ***shall*** *be endorsed by appropriately authorized* ►*Coordinating / Certifying Staff*◄ *on behalf of the organization when it has been verified that all Maintenance has been properly carried out by the organization in accordance with (iaw) approved procedures, taking into account the availability and use of the Technical Information (TI) [RA 48710 Technical Information], and that there are no non-compliances which are known to endanger Air Safety.*

(2) *The Certification of Air System Release* ***shall*** *be endorsed before flight at the completion of any Maintenance on the Air System.*

These words align very closely to EMAR/DASR-145.A.50 (a/b) – as follows:

(a) *A CRS for aircraft and a CRS for components shall be issued by appropriately authorised certifying staff on behalf of the AMO when it has been verified that all maintenance ordered/tasked has been properly carried out in accordance with the procedures specified in DASR 145.A.70, taking into account the availability and use of the maintenance data specified in DASR 145.A.45 and that there are no non-compliances which are known to endanger flight safety. AMC*

(b) *A CRS for aircraft shall be issued before flight at the completion of any maintenance.*

Note the careful use of several different terms and also exclusion of any reference to components (quite correctly).

---

[134] DASA's recognition of the Military Aviation Authority of the United Kingdom [Airworthiness Recognition Certificate of 14 Dec 18, Obj BO1195017] with respect to aircraft maintenance notes that; 'Military organisations generally do not hold approvals from the MAA-UK under the Maintenance Approved Organisation Scheme and are outside the scope of this Recognition'. There is no further 'recognition' opportunity available from AC004/2018 - Airworthiness Recognition in the DASP.

[135] This description of the UK MoD airworthiness system included feedback from: MAJ Mike Lavelle (SO2 Aviation Equipment Support Programmes Directorate – Combat Aviation, Army Headquarters); SQNLDR Andrew Lewis (Defence Safety Authority – Military Aviation Authority – International Engagement and Recognition) who recently served with 2SQN on exchange; CPLs Darren Moulton and Nicholas Reynard, lateral transfers from the RAF.

4.   The 'Certification of Air System Release' (CASR) is built into MOD Form 700 (the aircraft's technical log) as the '3rd signature' [analogous to a Cat-C licence holder performing CRS]. The '2nd signature' [analogous to a Cat-B licence holder working as Support Staff] signs for their own and supervised work. Transitioning the UK base maintenance construct to the line maintenance construct commonly used in Australia, both '2nd signature' and '3rd signature' are then analogous to a Cat-B MAML performing CRS. A '1st signature' conducts Task Sign Off (TSO) for their own work, but has **no** licence analogy – the UK use of 'Support Staff' alongside '1st signature' is not comparable to the activity of either a Cat-A or Cat-B licence holder, and represents a language difference between Australia and the UK. The activities of assessing and authorising the maintainer are explicitly devolved by the MAA to the maintainer's MMO, with oversight by the CAMO. Although authorisations are consistent across the UK MOD, the authority has not established Part 66 as a common baseline for trade training and experience and allows the respective Service to set their own training and development. This means that each Service's trade will differ to the extent of training received and for tasks within that trade and, subsequently, an individual is assessed as competent, and authorised, to use a '2nd signature' or '3rd signature'. The ensuing MMO assessment is portable, recorded as '*Authority Level Competency Identification*' codes, and retains its validity when the maintainer is posted between MMOs (including inter-Service), where re-authorisation occurs[136]. Combinations of '*Authority Level Competency Identification*' codes are analogous to a licence.[137] The UK system is intrinsically linked to UK trades (for each Service) and not to MAML categories described in DASR-66. The UK do not manage their workforce by 'exclusions and inclusions from a common (Part 66) standard', rather effort is required to understand an individual's trade scope but, once understood, then that bounds what work can be undertaken as a '2nd signature' or '3rd signature'.

5.   While there are some language differences, the UK MoD RA 4812 – *Certification of Air Systems Release and Component Release* (MRP 145.A.50) has equivalent intent and outcome to DASR-145.A.50 *Certification of Maintenance*. While the UK MoD does not use Part 66 or 147 for licencing or training of the RAF maintainer workforce, their regulatory system ensures that individuals are assessed as competent and that they are 'Suitably Qualified and Experienced Personnel' (SQEP) by application of RA 4806 – *Personnel Requirements* (MRP 145.A.30) and RA 4807 – *Certifying Staff and Support Staff* (MRP 145.A.35), with Staff records and authorisations retained by both the maintenance organisation (for at least two years after ceasing employment) and personally by the maintainer. In May 2022, the 'requirement for someone to be aged 21 to hold certifying/supervisory responsibilities' was 'withdrawn – not deemed regulatory material' on the basis of age discrimination. The RAF, RN and British Army each have different military trade education pathways, which results in individual achievements of the 'Authority Level Competency Identification' codes at differing times/ranks depending on Service career constructs. Regardless, the '*Authority Level Competency Identification*' codes are the touchstone,

---

[136] Manual of Airworthiness Maintenance – Processes (MAM-P) Ch 4.16 para 3 and 4.1. Broader than the UK, but within NATO, STANAG 3430 sets out the details of agreed cross-servicing arrangements for the flight servicing of Air Systems belonging to one nation by personnel of a different nation.

[137] From WGCDR Lewis (RAF), 23Sep23: *'STARS is a management system used by some elements of the Services (not all) to record Engineering Authorizations in line with the policy (Manual of Airworthiness Maintenance – Processes (MAM-P)). I believe the Authorization codes you have quoted are from the MAM-P predecessor document called the Manual of Maintenance and Airworthiness Processes-01 (MAP-01) [...which was withdrawn 30 Sep 2020]. A large body of work was conducted by the MAA and single Services to rationalise the policy and guidance which the MAP-01 provided alongside the regulations and uplift any 'regulation' from the document into our regulatory articles and of course remove confusing duplication in places. This rationalisation was also applied to the authorization tables so the number have changed since the individual who laterally transferred held authorizations. The intent of the 2nd sig in trade remains the same even though the authorization number has been updated (i.e. MAP-01 C182 would now equal MAMP - C317)'.*

or key authentication document, for a current or ex-UK MoD military maintainer when considering the authorisation of individuals as Certifying staff in a DASR-145 MO, when those maintainers do not yet hold a DASR 66 MAML.

6.   By acknowledging that the UK MoD has a different process for creating 'Suitably Qualified and Experienced Personnel' and that the output of their education and assessment system is a competent maintainer with MAA-controlled engineering authorisations, **the ADF can exploit the commonality** that exists between the UK MoD and ADF airworthiness systems (refer para 94 of main report) **through a 'standing GR.80(c) provision for UK maintainers' for use by FEGs in their Standing Instructions or AFCAMAN**. This is at the point of convergence within the two systems, specifically *Certification of Air System Release/CRS* which has common intent and outcome, but with differing education and experience pathways to meet entry criteria.

7.   To achieve this, and notwithstanding the opportunity for standardisation by HQAC A9, **we observe** that FEGs could promulgate a procedure that uses UK MAA *'Authority Level Competency Identification'* codes to authorised UK maintainers, who do not hold a DASR 66 MAML, as Certifying staff in a DASR-145 MO using DASR-GR.80(c) flexibility provisions. This could be achieved with words to the effect:

> *Current or former UK Military maintainers assessed and authorised as **Certifying Staff** or **Support Staff with Supervisory Responsibility** in accordance with RA 4807 – 'Certifying Staff and Support Staff' (MRP 145.A.35) may be authorised to issue a CRS without holding a MAML.*
>
> *The following UK MoD Manual of Airworthiness Maintenance – Process (MAM-P) Authority Level Competency Identification codes (Ch 06, Tables 2, 3and 5) apply:*
>
> - *CRS authorisation for Category B1 License activity: C316, C317, C326 and C328*
> - *CRS authorisation for Category B2 License activity: B201, B221, C317 and C328*
> - *CRS authorisation for Category B1 License [Armament] activity: C301, C302, C310, C311, C313, C314, C317 C322, D404 and D405*
> - *CRS authorisation for Structural activity: C317 and C331 as a minimum; possibly B224, C330 and D413 for more demanding structural repair activity.*
> - *CRS authorisation for Category C Licence activity: E507.*
>
> *UK Military Structural maintainers may have advanced training and experience if posted to specific Units. They will hold UK MoD Manual of Airworthiness Maintenance – Process (MAM-P) Authority Level Competency Identification codes B224, C330 and D413. DASR-145 QMs are to determine the scope of CRS authorisation recognising the differing extent of education and application of trade skills possible within the UK Military Structural workforce.*
>
> *UK MoD Manual of Airworthiness Maintenance – Process (MAM-P) Authority Level Competency Identification code E507 is analogous with CRS, code E516 is analogous with Release to Operator. UK SNCOs will normally hold both Authority Level E competencies, occasionally UK JNCOs may hold the E507 competency.*

8.   The use of GR.80(c) flexibility provisions (ie, a risk-based approach) is associated with an imperfect alignment of UK MAA *'Authority Level Competency Identification'* codes with a DASR-66 MAML, as well as potential for some variation with individual UK MoD personnel training and experience. The Australian DASR-145 MO needs to minimise this risk with regular checks and balances. Naturally, the Australian DASR-145 MO QM will apply all regular checks and balances in accordance with existing Board assessment criteria for the new maintainers and limit their CRS authorisation to recognised knowledge, experience and their unique trade boundary, along with local ADF aircraft Type training, DASR-145, and the execution of CRS in the ADF's Line Maintenance construct.

UK MAA Plans to use Part 66 and 147

1.   The UK MoD Military Airworthiness Authority (MAA) has not implemented[138] EMAR 66 and 147, as such, the MAA does not issue MAML or authorise MTOs. However, within its MAA Regulatory Publications (MRP) Part 145, the MAA uses civilian and military CAA Pt 66 licence holders within its contractor Authorised Maintenance Organisations (AMOs). This contrasts with the Military Maintenance Organisations (MMO) that retain established '1st, 2nd and 3rd signature' terminology. This required the introduction by the MAA of a further term, '**Support staff with supervisory authorization**' to provide greater equivalence for UK CAA Part 66 licence categories with traditional Military levels of signing Air System Maintenance documentation as a '2nd signature'[139].

2.   The MRP are equally applicable to both the MOD and contractors as a single system, applied through contract to those commercial organizations designing, producing, maintaining, handling or operating Air Systems and associated equipment, including ATM, in the UK Defence Aviation community[140]. When the civilian AMO adopts military processes, including the use of the MOD Form 700 as the Air System technical log, and the associated authorization framework, its personnel are authorized using the same '1st, 2nd and 3rd signature' terminology as used by an MMO. The '1st signature', '2nd signature' and '3rd signature' for maintenance tasks, and endorsing the 'Certification of Air System Release', are also expressed as Authority Level Authorisations[141]. Authority Level Authorisations provide a common point of reference for the competence of maintainers in an AMO and a MMO.

3.   The UK MAA media article in 2020 (reference above) that provided details of the background analysis for the 2015 decision, and later 2019 confirmation, not to implement EMAR 66 and 147 noted that:

> ***Single service initiatives***
>
> *As part of a wider programme seeking to update and enhance technicians in the Royal Electrical and Mechanical Engineers (REME) through career training. The Army Chief Air Engineer is currently engaged with the CAA to explore opportunities for CAA accreditation of elements of technician training.*
>
> *Whilst there is no current or future intent to issue any form of licence to REME technicians, there is an aspiration for technicians to be able to accrue examination credits towards a civil Part 66 licence (similar to an EMAR 66 MAML) as they progress through their military careers, gaining valuable in-service experience.*
>
> *If successful, this initiative would prove recruitment and retention positive by investing in the long-term benefits of personnel. Although still in its early stages, this programme has much potential, and the MAA will continue to monitor progress in support of this activity.*

---

[138] Evaluating the benefit of licencing military aircraft engineers, 15 Jun 20, Evaluating the benefit of licencing military aircraft engineers - GOV.UK (www.gov.uk), BP32466217.
[139] RA 4801 Certifying Staff, para 13, BP34260432.
[140] MAA01: Military Aviation Authority Regulatory Principles, Ch 4, para 5, BP43260435.
[141] Manual of Airworthiness Maintenance – Processes (MAM-P), Ch 0.6, BP34260430.

4.   The British Army advised the RT that the trial of Cat-A licences was positive and that they are planning to change their training and trade structures at EOY-2024[142]:

Until Nov 2024, initial trade training will remain a residential course attended at Lyneham following completion of Phase 1 training. Soldiers attend REME Common Foundation and Technician Maths/Engineering modules delivered through the Electro-Mechanical Training Contract (EMTC) before moving to the School of Army Aeronautical Engineering (SAAE). At SAAE they receive further aviation engineering theory and practical training delivered by military, civil servant and EMTC staff. Elements of this training is mapped to European Military Aviation Regulations at 'B' licence equivalence however no recognised examinations are completed. Training length is approx. 15 -20 months including periods of holding and it contributes to a level 3 Engineering Technician apprenticeship. Following completion of Initial Trade Training, technicians receive small modules of further trade training in their career such as Vibration Analysis at Supervisor and Cross Trade at Senior Supervisor. Depending on role, some Technicians will also attend specialist courses such as Non-Destructive Testing and Composite repair.

From Nov 2024 onwards, the Trade Training described above will be **further split into two phases of delivery both aligned to the Pt 66 syllabus.** This will provide more focussed training at the time of career-need that is at an externally recognised standard. In overview this will breakdown as follows:

a.   **Phase 2 trade training** will be a single trade course (i.e not Aircraft and Avionics.) An Aviation Technician Apprenticeship1, Level 3 contributing towards a CAA Pt66 A3(rotary) license qualification, delivered to Pt147 aviation industry standards (Course code F270). This training will provide the knowledge, skills and behaviours required of a technician during their first five years in the Field Force and enable them to attain the authorisations of a Pt 66 'A' licenced Aviation Certifying Mechanic. Training them to the recognised standard prevents 'over training,' gets them into the Field Force approx. 6 months earlier and maximises their productivity.

b.   **Phase 3 trade training** will be a blended, modular CAA Pt 66 B1.3/B2 qualification, attended between promotion to Cpl and promotion to Sgt, delivered to a Pt 147 industry standard. This training teaches the Pt 66 modules to a higher 'B' licence level required by the time technicians become Sgts and will enable them to attain the authorisations of a Pt 66 'B' licenced Certifying Technician. At this point, the technicians will be streamed either 'B1.3 Aircraft or B2 Avionics. By delivering this training in modules over 3 – 5 years, supported by the availability of online resources, advancement of our most talented technicians will be quicker whilst offering a route for all Cpl-Sgts appropriate to their experience. This additional shop-floor experience, coupled with fewer trainees needing training reduces overall training length and delivery resources. As Pt 66 B training follows the A training above, delivery of these activities will not be required until late 2025.

c.   **Specialist and role specific courses** will continue to be delivered as per the previous model.

5.   Figure 1[143] below shows the relationship between British Army maintainer's education, time, career progression, and CAA Part 66 licencing.

---

[142] REME Aviation Training Strategy – The plan to 2030, Annex C REME Avn REME Training Statement of Requirements, BP35238860.
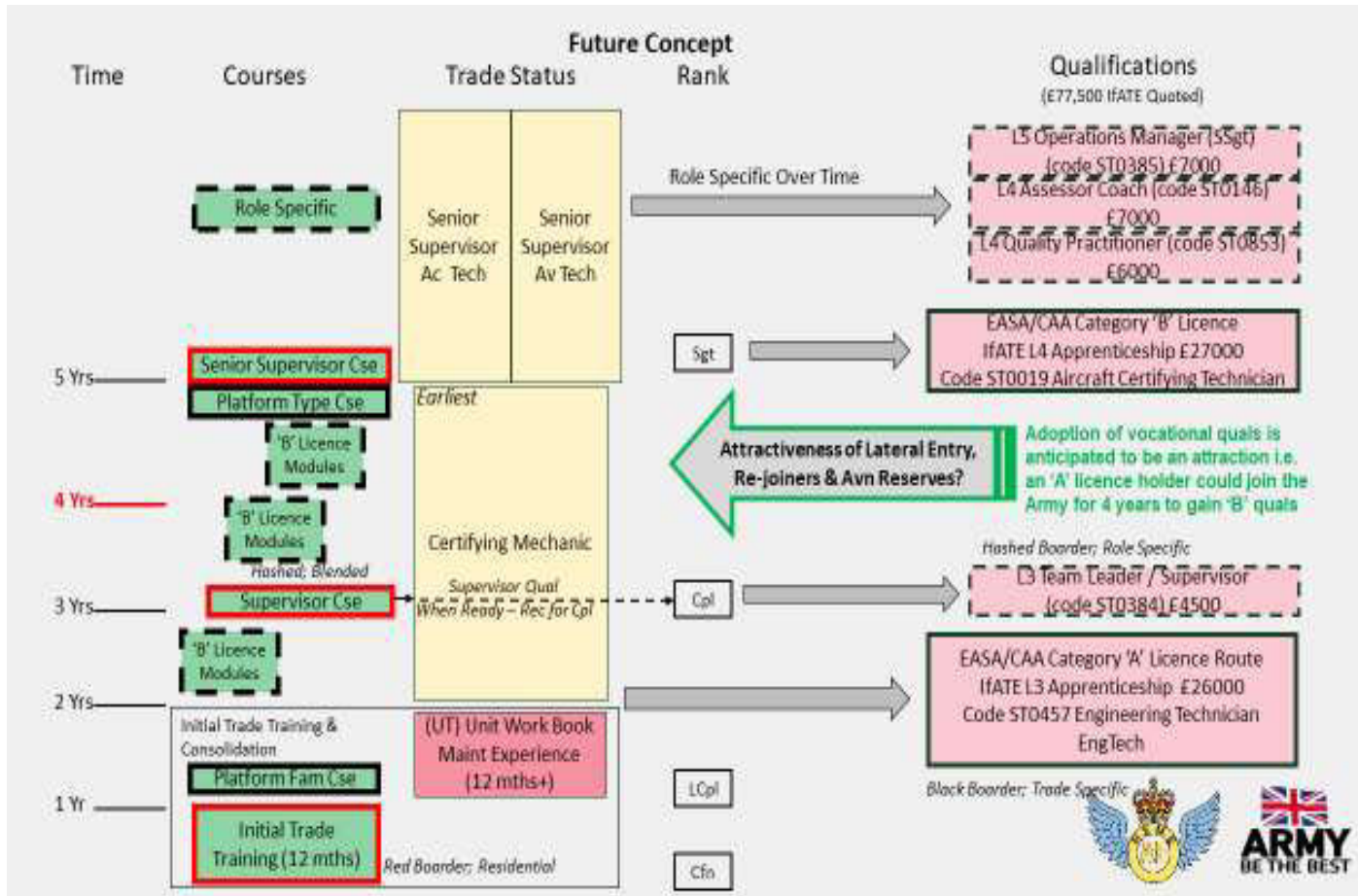[143] British Army Aviation Engineering PJ TITUS – AUS DOD Idea Sharing, PowerPoint, 2022, BP35238852.

Figure 1 –REME Future Concept of Workforce Development and Licencing

6.   Figure 2[144] below shows the primacy of the MAA Authorisation levels in the UK MRP system. The system is not changed[145] with the introduction of licencing – as only the Cat-A licence initiates a change in Authorisations from a 'Level A' to a 'Level B'. After that point, Authority Level authorisations straddle both rank and Cat-B and Cat-C licencing. For the UK military, Licencing is being viewed as an attraction, retention and 'whole-of-work force' initiative, that streamlines the training system. However, holding a licence is not a constraint within the UK system for attaining authorisation to issue a CRS.

7.   As detailed in Annex E, given their Base Maintenance construct, when a person attains Authority Level E507 'Co-ordinate MWOs', which is the '3rd signature' in the MMO and termed 'Certifying Staff' in the MRP 145, it equates to activity of Cat-C licence holder. If the UK personnel were transposed to a 'Line Maintenance' construct, then the maintainers holding Authority Level C317 'Sign 2nd signature for supervision of work within trade boundary, regardless of 1st signatory's rank'(in the UK's Base Maintenance construct there people are termed 'Support Staff with Supervisory Responsibilities') would be working as a Cat-B licence holder.

---

[144] British Army Aviation Engineering PJ TITUS – AUS DOD Idea Sharing, PowerPoint, 2022, BP35238852.
[145] Email Lewis/Crowe of 24 Aug 23; *'The MAA are monitoring how the REME/Army progress with this initiative. However, since aligning the training and then subsequent recognition for either A licence or eventually B licence by the CAA is a retention initiative and not a wholesale change in authorization structure, the intent of the MAA MRP authorization structure will still be met (ie, as I understand it, this in not a military licence, rather a recognition of REME training aligned to CAA Licence).*
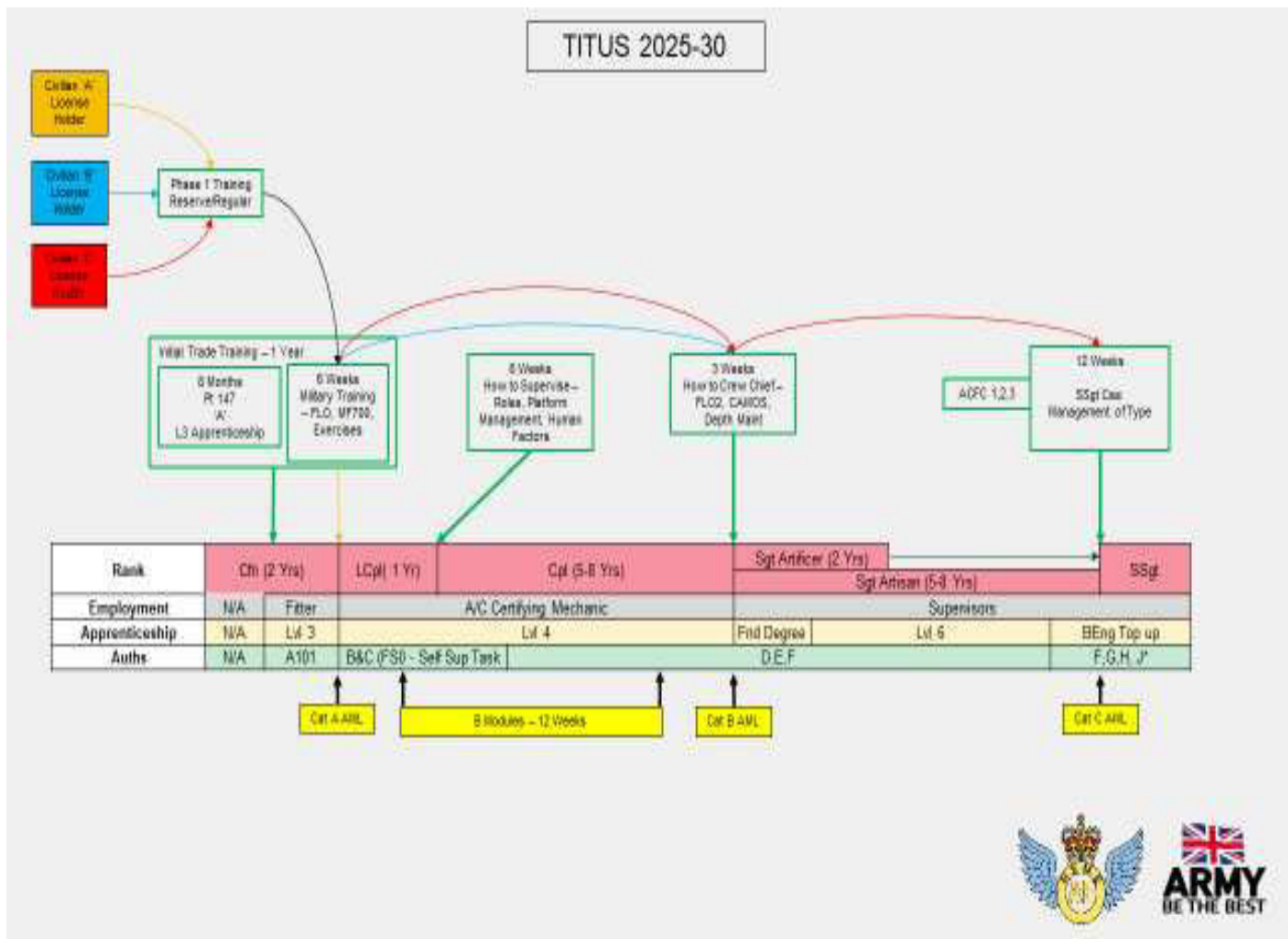
Figure 2 –REME Future Workforce Employment, Authority Authorisation and Licencing

8. UK staff[146] advised that:

- By mid 26, when REME have a Cat-B licence pathway, they expect the MAA will have created its own licence system and can issue their own 'military' licence.
- RAF and RN are 'watching'[147] what Army is doing.
- Army has had excellent cooperation with the UK CAA. Note that CAA is the regulator for the Army 147 schools and training logbook entries are recognised by the CAA. CAA also see military as a future source of civilian licence holders (known quantity) as they have an impending chronic civilian workforce shortfall.
- Australian Army Apache trainees recently embedded with a UK MMO were assessed by the Unit CO, in consultation with MAA staff, as being '**safe to work on our aircraft'** because they held a DASR-66 MAML, and via EMAR, the UK could recognise that in their Regulatory System.

9. We view the changes that REME are making to align their training system to EMAR-66 will result in a smoother transition for lateral transfers to the Australian Army and Defence Industry.

---

[146] Telecon Crowe/Lavelle of 15 Aug 23.
[147] Email Lewis/Crowe of 24 Aug 23; 'The RAF and RN will be looking to see the impact from a retention and recruitment perspective.'