MEAP17

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MAA External Audit Panel 2017

Report

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1. Executive Summary

1.1. Previous MAA external audits in 2012 and 2014 sought, respectively, to determine progress made in the implementation of recommendations made by Mr Justice Haddon-Cave following his 'Nimrod Review' (MEAP12), and to assess the effectiveness of the MAA as a regulatory body for Air Safety (MEAP14). The most recent of these, MEAP14, pronounced the MAA an effective air safety regulatory body, fit for purpose in its current role, but with the opportunity to improve further as it continued to develop. The MEAP14 panel were also satisfied that the 'Nimrod Review' recommendations had been implemented as intended, and that all remaining MEAP12 issues had been addressed.

1.2. At the request of Director MAA (DMAA), the 2017 MAA external audit panel (MEAP17) convened over the period 26-30 June 2017 to assess the MAA for:

Effectiveness as a safety regulator.
Preparedness for risk-based assurance.
Progress of recommendations of MEAP14.

The panel comprised a broad cross-section of nine civilian and military professionals drawn from: UK Airprox Board; UK Civil Aviation Authority; UK Health and Safety Executive; UK Care Quality Commission; UK Defence Maritime Regulator; French Military Aviation Authority; and German Military Aviation Authority.

1.3. The MEAP17 Panel conducted a week-long review using a sampling approach that looked at a cross-section of the work of the MAA from both an internal and external perspective. This included interviews to gain an insight into the views of external stakeholders within the military aviation community and selected industry partners, as well as discussions with a selection of MAA staff officers to explore internal process and effectiveness. The panel also observed the first day of an MAA CAMO audit being conducted at RNAS Yeovilton.

1.4. This report details the outcomes and associated recommendations from the MEAP17 review. The overarching impression of the MEAP17 Panel was that the MAA continues to exercise a very positive impact on Air Safety, is delivering a regulatory function broadly in line with its regulatory policy, and all respondents considered that the MAA convincingly stimulates the positive development of a favourable Air Safety culture throughout its areas of influence. It was clear that the regulated community considered that the Duty Holder (DH) model added real value, and they welcomed the strong, effective and respected leadership that the MAA engenders from its activities.

1.5. All those questioned commented that although they could not operate properly without the MAA, they recognised that both they and the MAA were on a journey towards full effectiveness, and still had some distance to go. More specifically, staff working both within the MAA and the external regulated community felt there was an opportunity to reflect more broadly on the MAA's character as a regulator, with some concerns that the MAA's dual role as auditor/enforcer and co-production partner was leading to confusion. A wide variety of views were expressed at differing levels of the community, ranging from very strong support for the MAA's partnership role to significant concerns being expressed

by some that this may lead to a risk of dependency on the MAA to solve the regulated community's problems, with an associated 'learned helplessness' that may result. Having evolved the assurance process as stakeholder safety structures/systems had themselves developed, some felt that there appeared to be an overall overreliance within the regulated community on the MAA as an auditor that would 'ultimately act as goalkeeper', with the perceived comfort blanket that this brings. Others thought that although extant MAA processes did a reasonable job of specifying what was required, they did not offer much guidance on 'what good looked like'. A number of respondents were supportive of the concept of developing the 'enforcer' and 'partner' functions along separate parallel tracks with clear boundaries to allow more independence of the auditing/enforcing function and clear water between this element and any co-production activities.

1.6. In truth, the MAA is presented with an eclectic mix of experience within stakeholders and has had to deliver each role in parallel as both the regulator and regulated community have matured. Panel members with experience in other sectors recognised the dilemma but opined that, now that the initial processes have largely bedded-in since the MAA's formation, a positive decision needed to be made on regulatory character since this will have an impact not only on how the MAA conducts its business, but also on what resourcing level it requires as it continues to mature and embed as an organisation. In short, the boundary between 'Regulatory Policeman' and 'Critical Partner' has yet to become clear, D MAA may wish to continue in the current vein in the short-term, but clarity of regulatory ethos would assist stakeholders and internal staffs in developing their future relationships; although the MAA staff may be clear about their activities, the comments from their community indicated that, externally, many were not.

1.7. With regard to the MAA's preparedness for risk-based assurance, the MEAP17 Panel concluded that, although a promising start had been made, there was some way to go before a judgment could be made on how effectual this was. There was no lack of data being gathered by the MAA, but its fruitful sifting and analysis into intelligence, knowledge and then wisdom was not yet evident. There were two main concerns in this respect: data collection and analysis seemed to be somewhat stovepiped from the operating assurance and compliance activities; and the tools for data synthesis (namely ASIMS and the ASD) were hugely labour-intensive, not integrated, and seemed to be designed from the analyst's perspective rather than the operator's. With circa 13,000 DASORs a year, there is simply not enough staff time available to discover all the essential information, join the dots and formulate themes: much more could be done using data-mining techniques within the ASD, but the fact that the ASD has no electronic interface with ASIMS means that this is not possible without extensive manual intervention. All-in-all, the ASD, which should be the easily accessible front-end to the ASIMS data repository and MAA knowledge base, was not considered effective in interactive risk-based analysis and reporting; it appeared to be hugely lagging as a tool and was not the provider of leading indicators that a risk-based assurance system properly requires.

1.8. Beyond this challenging ASD situation, the Panel were also concerned that analysis activities seemed to be somewhat disconnected from planning and operational activities. For example, there was much discussion with various stakeholders and staffs during the audit about assurance issues that had surfaced 6 months or so ago regarding Sentry and

Tutor; these were well known by MAA staff, and work was underway within, and external to, the MAA to understand and address the associated risks. However, on interrogation, the ASD still showed no evidence of any problems at all for those platforms, and key documents relating to their resolution appeared not yet to have been uploaded to the ASD. Notwithstanding, MAA staff were actively working to embody risk-based processes into their thinking despite the inefficiencies of the structure and systems; however, at the time of the audit, risk assessment appeared to be very much a manual activity based on a subjective and retrospective generation of simple standalone heat-maps rather than a systematic process that flagged-up trends and future concerns in a pro-active manner.

1.9. Resource was clearly recognised as a challenge both internally and externally to the MAA; during the audit programme, numerous interviews touched on this with a surprising spread of responses ranging from 'seriously undermanned' to 'overmanned and the personnel are in the wrong areas'. Also, the MAA appeared to most stakeholders to be quite process-focused which, in turn, seemed to constrain its ability to flex resources. In reflecting on the resourcing issue, the Panel's overall view was that MAA does not have enough of the right people but are trying their best to do what they can with what they have, including improving efficiency. Recognising that extra resource on its own may not necessarily be the solution, the Panel expected there to be a workforce plan in place aimed at building capability against a future MAA strategic model: in this respect, the move to risk-based assurance may well be an opportunity to consider a more productive and effective model overall, and the Panel also saw potential for more shared regulatory and assurance activities with the CAA (with some commenting on potential efficiencies from collocation). The MAA structure appears still very much based on the original introductory design, and the changes brought about by overlaying the DSA onto the organisation have created further tensions. Within the current structure, there were clear indications that some personnel were being particularly stretched, and the rotation of military posts at anything from 15 months to 2 years verses the longevity of civilian positions, added to the stress and challenge of maintaining competence and continuity. The Panel felt that the current two 2-stars, three 1-stars and six OF5 graded posts might benefit from being refocused into a less hierarchal, flatter structure that could provide offsets for a more customer-focused approach, better integration, and broader specialisation amongst the staff.

1.10. It was clear to the Panel that the stand-up of the DSA has added a certain amount of complexity to the MAA's activities and has also been greeted with a degree of nervousness within the regulated community. Although it was recognised that there would be benefits from sharing best practice within the DSA, there were also concerns about losing the MAA's unique focus on Air Safety within a more generic 'Safety System': all stakeholders worried about a potential dilution of the MAA's focus, and the loss of hard-won improvements within the air domain over the last few years.

1.11. In conclusion, of the four Strategic Outcomes[1] articulated within the MAA's 5-year strategic plan, the MAA are performing well as a catalyst for promoting a positive Air Safety Culture and in establishing themselves as a recognised learning organisation at the

[1] Namely: Regulation; Assurance; Air Safety Culture; and Recognised Organisation.

forefront of air safety thinking. However, there is still progress to be made in developing their regulatory posture, and in the establishment of robust risk-based assurance. Notwithstanding, the comments included in this report are intended to provide constructive suggestions to assist in the evolving maturity of what is, overall, a respected and largely effective regulatory body.

1.12. With regard to the process of audit itself, the MEAP17 team benefited greatly from contact with the MEAP14 Leader prior to commencing the audit, and consideration should be given to including a MEAP17 member in the next audit for continuity. Splitting the team into two elements (a 'home' and an 'away' team) worked well in ensuring broad coverage of stakeholders and MAA staff, but consideration should be given to scheduling a longer overall period to facilitate a fuller audit and time for coordination of evidence between the teams. Observation of the MAA command battle rhythm would have been of benefit, as would attendance of a full MAA audit, the MEAP17 Panel were only able to view the first day of an MAA CAMO audit to get a flavour of the activity.

1.13. The MEAP17 Panel and interviewees were as follows:

MEAP17 Panel

Air Cdre (Retired) Steve Forward – Director UK Airprox Board **Team Leader**
Ms Ellen Armistead – Deputy Chief Inspector of Hospitals, CQC
Mr Peter Baker – Chief Inspector of Construction, HSE
Mr Nick Thorpe – ANSP Oversight Specialist, CAA
Mr George Monteiro – Principal Airworthiness Surveyor, CAA
Cdre Steve Pearson – Head of Defence Maritime Regulator, DSA
Capt de Frégate Nicolas Bergamotto – Head of Strategy & Safety Management, DSAÉ
Herr Björn Oeltjen – Recognition, Luftfahrtamt der Bundeswehr
Oberstleutnant Carsten Bolk – Recognition, Luftfahrtamt der Bundeswehr

MEAP17 Interviewees

External: AOC 1Gp, ODH; AOC 2Gp, ODH; AOC 22Gp, ODH; HQ Air Command COS Ops, ODH; Comd JHC, ODH; DE&S Dir Hels; DE&S Dir AS; HQ Air Command Air Safety Centre IFS; Voyager TAA; SPMAP RW TAA; Watchkeeper DDH; JHC ODH Senior Operator; Stn Cdr RAF Brize Norton, DDH; Air Tanker personnel; JHC personnel; Air Tanker; Rolls Royce; Petards Joyce-Loebl; U-TACS; RFD Beaufort; Hawker Hunter Aviation; and Britten Norman. The only noticeable senior military omission from the list above was ACNS Aviation and Carriers, ODH for the maritime elements of the RN Fleet Air Arm, who was unavailable due to other commitments.

Internal: Director MAA (D MAA); Director Technical (DTech); Head Analysis and Plans (Hd A&P); Head Oversight and Approvals (Hd O&A); Head Regulation and Certification (Hd R&C); 5 of 6 OF5s (omitting Deputy Head Analysis who joined on 26 June 2017); and 16 other key personnel from each branch of the MAA.

2. Recommendations

2.1 Major Recommendations

The following major recommendations are raised within the report:

2.1.1 **MAA Structure**. Conduct a root-and-branch review of MAA structures, manning and resources in the context of embracing a risk-based approach and potentially offering efficiencies in employment of resources (Paras 3.6.3 and 3.6.8). In particular, consider restructuring the MAA analysis team to reflect better the more integrated requirements of the risk-based approach as a cross-cutting activity (Paras 3.3.5 and 3.7.7), and developing portfolio manager/liaison positions between the regulated community and the MAA at desk-level (Para 3.6.2).

2.1.2 **Knowledge Management**. Improve the integration and usability of ASIMS and the ASD (Para 3.7.2) and integrate all tools that hold source information to enable a level of automatic data-mining, analysis and decision support in order to provide the foundation for risk-based activities (Paras 3.3.4 and 3.7.6). Also, conduct an internal audit of information held within the ASD to ensure that evidence against baseline of compliance is held for each relevant organisation/entity (Para 3.3.1).

2.1.3 **Assurance Activities**. Validate audits for the right balance between assuring DHs' safety management systems and the independent verification (at management, risk control, and primary barrier levels) of proportionality and robustness to achieve safety outcomes (Para 3.2.9). Consider also the benefit of conducting unannounced analysis-led audits (Para 3.2.10). Whilst reviewing MAA assurance activities, consider also conducting a cost-benefit review of overall DH assurance requirements, processes and structures to ensure that they are still the most effective method versus the degree of effort and attendant resource demands involved (Para 3.2.12).

2.1.4 **Transparency**. Consider the introduction of an OF5-level forum to ensure fuller transparency at all levels, and an annual conference/event for smaller stakeholders in the community to promote better information flow and confidence (Para 3.2.15).

2.1.5 **Cooperation**. Consider further cross-fertilisation with other regulators (especially the CAA) regarding the latest risk-based ideas and concepts that would likely be to the benefit of both organisations (Para 3.3.6); in particular, consider more liaison and cooperation between MAA and CAA in order to maximise resources, reduce oversight activities and share best practices (Para 3.5.8).

2.1.6 **Safety Culture**. Review efforts to assess safety culture in other sectors, seek best practice and develop a tool to objectively measure air safety culture (Para 3.4.4).

2.2 Minor Recommendations

The table below provides a summary of the minor recommendations raised within the report, collated by MAA Key Conditions.

Section	Para	Recommendation
Key Condition 1: **Effective Regulation**	3.2.4	Routinely report performance against the 4 Strategic Outcomes and 6 Key Conditions to stakeholders.
	3.2.5	Review regulations to reflect emerging non-UK equipment/platform issues.
	3.2.6	Review regulations to reflect emerging and non-traditional technologies.
	3.2.7	Review the MAA's ability to widen the scope of its activity to include all applicable aviation requirements based on the EASA model.
	3.2.8	Ensure all regulatory amendments are widely consulted upon and publicised prior to promulgation.
	3.2.9	Consider a review to MAA01 Chapter 2 to inform the regulated community to guard against over reliance on external audit findings over and above internal audit requirements.
	3.2.13	Consider the benefits of formalising SDH assurance activities of ODHs, and of MAA assurance of SDHs.
	3.2.14	Develop end-to-end holistic assurance themes as opposed to the current segmented approach to RTS assurance.
Key Condition 2: **Risk Based Assurance**	3.3.5	Review the visibility and availability of information held within the MAA to ensure collaborative access across all areas of the MAA rather than stovepiped within specialisations.
	3.4.3	The MAA should encourage the regulated community to ensure that more cultural emphasis is given towards achieving safety outcomes rather than a culture of serving the processes themselves.
Key Condition 3: **Engaged Air Safety Culture**	3.4.5	MAA to consider how to engage with DSA, SDH and ODH staffs to develop comprehensive pan-environment measurements of safety culture and safety leadership effectiveness.
	3.5.3	The MAA consider re-baselining the MOC's purpose and also widening its attendance to include key DH-facing organisations such as DIO.

Section	Para	Recommendation
Key Condition 4: **Recognition, Cooperation and Reputation**	3.5.4	A broad review of safety training requirement should be conducted across Defence to identify safety training needs and allow the MAA to refocus DHASC.
	3.5.5	Consider holding a semi-annual desk-level workshop intended to clarify the rationale behind forthcoming changes or recent issues, provide a focus for communication with the regulated community at desk level, and provide a direct feedback process to critique MAA performance and perceived regulatory burden.
	3.5.6	Review the policy towards application of Def Stan 00-970.
Key Condition 5: **Structural/Resource Agility**	3.2.10	The combination of DAOS and MAOS audit types within one audit team may reduce both MAA's resource needs and the regulatory burden on industry.
	3.6.4	Review the current CAMO structure to see whether rationalisation by activity or class of aircraft is more suitable than by aircraft type.
	3.6.5	Review military personnel selection and training process to gain full value from tour length.
	3.6.8	Press for clarity on the DSA future structure and applicable responsibilities in supporting the regulator – alongside DSA, review the supporting functions and create a clear break after review of either retaining or completely de-latching support, relying on DSA to provide core support functions.
	3.6.8	Consider the formation of a Defence Safety Centre.
Key Condition 6: **Effective Knowledge Management and Information Exploitation**	3.7.2	Introduce internet-based ASIMS as per MEAP14 recommendations..
	3.7.5	Consider sharing ASD input and access with the DH-levels.
	3.7.8	Influence the DSA to facilitate the quicker circulation of critical information from SIs so that DHs can address safety issues earlier.

3. Discussion

3.1 MEAP17 Concept of Audit

3.1.1 In convening MEAP17, D MAA asked the Panel to assess the MAA specifically for:

Effectiveness as a Safety Regulator.

Preparedness for Risk-based Assurance.

Progress of recommendations of MEAP14.

3.1.2 The MEAP17 team reviewed relevant MAA regulatory policy and strategy documentation[2] in preparation for the audit and decided to conduct the assessment within the framework of the MAA's four desired Strategic Outcomes from its current 5-year strategic plan as published in July 2016; namely:

Regulation - develop appropriate and effective regulation that is forward looking, responsive to external factors and evidenced from MAA assurance activities.

Assurance - ensure that the MAA conduct intelligent assurance of UK DAE[3] activity worldwide, resulting in comprehensive understanding and judicious management of RtL[4] utilising a risk based approach.

Air Safety Culture - support the development of a UK DAE with a demonstrably strong and enduring Air Safety culture exemplified by associated behaviours.

Recognised Organisation - recognised as a learning organisation in relation to the UK DAE and aviation Regulators worldwide, acknowledged by all as being at the forefront of Air Safety thinking and sustained in that position through sharing good practice and engagement.

3.1.3 In expanding these Strategic Outcomes within their strategic plan, the MAA describes six Key Conditions that determine their effectiveness in achieving the Strategic Outcomes: **Effective Regulation; Risk Based Assurance; Engaged Air Safety Culture; Recognition, Cooperation and Reputation; Structural/Resource Agility;** and **Effective Knowledge Management and Information Exploitation**. In order to provide D MAA with a comparator for his own assessments, these six Key Conditions were also used by the MEAP17 Panel as the investigation and report structure.

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[2] Principally: MAA01 Issue 6 (Regulatory Policy); MAA03 Issue 9 (Regulatory Processes); 2016DIN06-020 - MAA Enforcement Policy; MAA Five Year Strategy July 2016; Charter for the UK Military Aviation Authority – 31st August 2010; and Charter for the Defence Safety Authority – 24th March 2015.

[3] DAE – Defence Aviation Environment.

[4] RtL – Risk to Life.

3.1.4 The MEAP team met in advance of the formal visit period to consider the programme, team composition and employment, and overall concept for the execution of the audit. The Panel benefitted from the attendance at this session of the previous MEAP14 Team Leader, who, along with one of his MEAP14 team (who was intended to participate in MEAP17 but could not due to unforeseeable circumstances), provided advice on what had worked and not worked during their audit. The MEAP17 audit itself had been allocated five days (26-30 June 2017) by D MAA for field work and gathering of information, which was primarily to be achieved through interviews and documentation review. On the first day, the whole team met at MAA Abbey Wood and jointly conducted interviews with the MAA executive team. Thereafter the MEAP17 team split into two elements: half conducted interviews within Abbey Wood and the Bristol area; and half conducted interviews away from Bristol during the 3 middle days of the audit. The two teams conducted corroboration calls to update on information gleaned during each day to ensure a coordinated approach to the next round of interviews, and then met on the final day to synthesise observations and compile a hot-wash-up outbrief for D MAA. Those who were able to attend also gathered 3 weeks after the audit for a post-event wash-up and report-compilation session to agree themes for the report. Notwithstanding these attempts to ensure coordination, a lesson for future audits was that a consolidated period immediately after the field-interview week would have been useful to merge the findings of both team elements. Although this will extend future audits beyond a week, a couple of days in the week beforehand to conduct the initial set of interviews, followed by a weekend to deliberate and then finish all interviews by the middle of the following week would then have allowed 2-3 days of concentrated effort at the end of the second week to compile the primary themes whilst fresh in everyone's mind.

3.1.5 In addition to the 5-day core period, the opportunity was also subsequently taken by two members of the team to observe the first day of an MAA CAMO audit. This added important context to how the MAA conducts its activities but was necessarily only a snapshot; additional time for such observations of MAA audit activity would have provided greater understanding of the procedure and methodology.

3.1.6 It is important to understand that the brief MEAP17 audit period precluded an extensive review of the full range of the MAA's activities and document set, or an in-depth observation of the end-to-end processes that drive the internal business. In forming a view on the MAA's effectiveness as a regulator, the Panel explored, through engagement with their regulated community, the implementation of the MAA's own high-level policies and strategies, and the expectations set on all regulators within the Regulator's Code.[5] The addition within the Panel of non-aviation regulatory specialists provided an important comparator to other sectors and, although they had no need to understand the detail of the MAA's documentation and processes, they were able to gain a high-level view of overall effectiveness from discussions with a selection of key personnel in the wider regulated community. Notwithstanding the brief period of the audit, the Panel feel they obtained sufficient consistent and corroborating evidence to form a view on the three areas of audit requested by D MAA.

[5] Published by the Dept for Business Information and Skills Better Regulation Delivery Office in April 2014.

3.2 Key Condition 1: Effective Regulation

3.2.1 An effective regulator is an organisation that is proportionate and consistent in its approach, and is able to manage the dynamic of being both an enforcer and supporter to the regulated community. The Regulator's Code states that regulators should: carry out their activities in a way that supports those they regulate to comply and grow; provide simple and straightforward ways to engage with those they regulate and hear their views; base their regulatory activities on risk; share information about compliance and risk; ensure clear information, guidance and advice is available to help those they regulate meet their responsibilities to comply; and ensure that their approach to their regulatory activities is transparent.

3.2.2 The MAA lays out 6 principles within its Regulatory Policy (MAA01[6]) for how it conducts its regulatory activities. These are through: Risk Based Assurance; Minimal Regulatory Burden; Independence; Proportionate Sanctions Regime; Optimization; and Feedback. As previously mentioned, the MAA measures its achievement of these principles by considering its performance against six Key Conditions designed to ensure the achievement of its Strategic Outcomes. The Panel were informed that these Key Conditions are considered and reported on during the MAA Command Battle Rhythm but, unfortunately, the timing of the MEAP audit did not allow for the Battle Rhythm to be witnessed, and evidence that Key Condition performance was being monitored during the day-to-day business conducted at desk level was not observed by the Panel.

3.2.3 Notwithstanding, it was widely recognised by stakeholders that the MAA has evolved significantly during its seven-year existence from an initially highly-prescriptive and directive regulator to a more collaborative organisation. Like other sectors, the military air safety regime has built on the principle that those who create risks are responsible for properly managing and controlling them; the DH model has become well understood, has had a positive impact on safety, is universally welcomed, and enables clear understanding of the role and responsibilities of the regulated community. More fundamentally, the MAA's ability to enforce changes in processes or rules that have perpetuated from the past was recognised as a force for good in the contemporary air domain.

3.2.4 However, having successfully nurtured a revolutionised and reinvigorated air safety environment, the MAA's regulatory position regarding the balance between securing DHs' compliance through approvals, assurance and enforcement versus collaboration/co-production is now an emerging source of uncertainty within the regulated community. Clarity of regulatory ethos would assist stakeholders and internal staffs in developing their future relationships, with some stakeholders worrying that too much 'partnership' engendered a sense of over-reliance on the MAA to solve the community's problems, with a resulting 'learned helplessness'. Ultimately, the ethos must fit the need of the MAA and the regulated community, and will probably be determined by MAA performance in respect of the four strategic outcomes; that being said, the MEAP17 Panel was unable to confirm whether these outcomes were regularly being assessed in this context.

[6] MAA01 Issue 6 was the extant version at the time of the audit.

Post-audit clarification. Although the Panel did not themselves see evidence of these outcomes being reviewed, D MAA subsequently confirmed that they were routinely assessed within his Command Group meetings (which the Panel did not observe in the timeframe of the review) and, other than by exception, escalated to MEB on an annual basis. Notwithstanding, the Panel felt that these assessments could be cascaded more overtly within and external to the MAA.

Recommendation: *Routinely report performance against the 4 Strategic Outcomes and 6 Key Conditions to stakeholders.*

3.2.5 The MAA Regulatory Document Set (RDS) has been much improved over the last few years and is now far more coherent and better understood. Inevitable changes have been made as the overall system has settled down, and the regulated community now feels better able to react, interact and contribute. Notwithstanding, some saw problems in trying to align MAA regulations with civil regulations, especially within fleets for which both applied. More specifically, those with platforms in civil-military-international environments perceived vulnerabilities where they operated with risks that were managed by contractors' or other nations' safety systems upon which they had no real visibility, input or influence for legal or national reasons; this left DHs operating on the basis of trust alone. With the advent of platforms with federated maintenance facilities or proprietary national systems (such as A400 and F35 for example) the inability of the MAA or DHs to independently assure activities is likely to cause issues in the medium-term.

Recommendation: *Review regulations to reflect emerging non-UK equipment/platform issues.*

3.2.6 Others commented that more flexibility in the application of regulations was required: the core platform assumption within the RDS is that of a medium-sized manned aircraft, which does not fit all. Some felt that there was a need to review regulations further to embrace, more comprehensibly, emerging and non-traditional systems which are creating new challenges of their own (notably unmanned vehicles which, unlike traditional systems, have no 1st-party human risk,[7] and parachuting which does have 1st-party risk but apparently is not viewed as a system manned by a 'pilot' and so falls short in respect of human factors considerations that would normally be expected within a piloted-system). Also, small companies reported that they still feel the burden of regulation, which needs to be applied more proportionally to reflect their resources and structures; it was, however, recognised that the MAA are moving towards this.

Recommendation: *Review regulations to reflect emerging and non-traditional technologies.*

[7] Although the MAA rule-set RA1600 covers UAS operations overall, some organisations have Remotely Piloted Air Systems being assessed under MRP145, which is better suited to manned aviation. Several parts of the UAS construct do not fit well within MRP145 and, particularly for some of the supply chain (such as spare parts supply), MRP145 may not be appropriate.

3.2.7 With regard to the overall regulatory framework, there did not always appear to be adequate oversight to confirm compliance with all applicable equivalent civil regulatory requirements.[8] It appears that the MAA has cherry-picked only some of these requirements due to resource constraints (for example in the case of Sentry there appeared to have been a suspension of oversight of its CAMO and several organisations for some period: see Manning Update-Oversight and Approvals-06/01 when 32 CAMOs and 27 MRP Part 145s had temporary oversight suspension); this introduces variability in standards and reduced safety assurance of the end product.[9] With respect to EMAR 21, it is unclear why the production element (PAOS) is not included, with only the (DAOS) requirement being adopted. Furthermore, due to similar standards in multinational programmes, deeper implementation of EMARs may also help to ease international cooperation in the field of certification. Overall, it appears that only parts of the regulation are adopted and, in the process, some important parts are omitted, such as ACAMS.

Recommendation: *Review the MAA's ability to widen the scope of its activity to include all applicable aviation requirements based on the EASA model.*

3.2.8 The decreasing rate of regulation change was universally welcomed as stabilising the framework and reducing the change-burden. During what has been a turbulent period, there appeared to have been a mixed picture regarding involvement in the development of changes: major changes (such as the recent changes to air display regulations) seemed to have been well communicated through the Notice of Proposed Amendment (NPA) process and were conducted in good collaboration with the regulated community (even if decisions on their final content did not always appear to be transparent). However, minor, unheralded changes appeared not to be as well dealt with and were particularly unwelcome. Small changes can appear less obvious, can have a disproportionate effect on small operators and companies, and can also cause difficulties if made too frequently; accepting the need to correct time-critical safety issues, the temptation to 'tinker' with regulations needed to be resisted in favour of a set programme of changes and the Panel were heartened to hear that, subsequent to their review, the MAA had introduced a process for amendments to be promulgated on a scheduled, calendar basis.

Recommendation: *Ensure all regulatory amendments are widely consulted upon and publicised prior to promulgation.*

3.2.9 Assurance activities have matured as MAA staff and external stakeholders become more familiar with the processes and structures. That being said, MAA audits were perceived by some as focussing on delivering the process as an outcome in itself rather than safety

[8] There is a civil system of requirements that work together, EMAR 21, EMAR 145, EMAR 147, EMAR 66 and EMAR M - these are based on a proven EASA model that has worked well.

[9] Section B procedures for national Military Airworthiness Authorities has been withdrawn. This may have shaped regulator behaviour and included, for example, an ACAM programme which would be found in the current Section B of EMAR M. e.g M.B.303(b) Aircraft Continuing Airworthiness Monitoring (ACAM), AMC M.B.102(c) NMAA - Qualification and training.

outcomes *per se*. Overall, there were mixed views about MAA audits. Many stakeholders felt that any move to focus MAA audits only on assuring the adequacy of DHs' 2nd-party assurance activities would reduce their value, and some sought reassurance that the MAA would still conduct verification interventions to sample real safety issues and thus support ODHs by potentially highlighting areas that their teams may miss as well as providing independent assurance to stakeholders, including Ministers and the public, that ODHs were properly managing and controlling risks. On the other hand, others were happy for the MAA to withdraw to an approach that saw them simply audit the 2nd-party auditors and their processes, leaving the detailed assurance activities to those who oversaw the practitioners. On the whole though, the MAA assurance burden was perceived, thankfully, to have reduced since the early days of the MAA; however, although this was welcome, there was still a call for more coordination of audit activities across the 1st-, 2nd- and 3rd-party assurance levels. There was also recognition that a positive outcome from an MAA audit gave DHs only limited assurance on the specific issue or area examined at that time, and therefore needed to be treated with caution rather than be seen as an overarching 'bill of good health'. In all of this, there was a call for the MAA to be clearer about what MAA assurance really means, where it will focus during specific audits, their thoroughness, and their worth. This also requires sufficient capability in MAA to be able to critically examine and, where necessary, challenge the rigour and proportionality of DHs' SMSs, as well as their specific risk controls and barriers.

Recommendation: *MAA validates audits for the right balance between assuring DHs' safety management systems and the independent verification (at management, risk control, and primary barrier levels) of proportionality and robustness to achieve safety outcomes.*
Recommendation: *Consider a review to MAA01 Chapter 2 to inform the regulated community to guard against over reliance on external audit findings over and above internal audit requirements.*

3.2.10 The regulated community had varying views on the effectiveness of the current audit programme. Currently, DAOS and MAOS are handled separately in different audit teams and, since several companies have both Design and Maintenance Approvals, different audit teams end up visiting the same company. Furthermore, some industry stakeholders criticised a lack of consistency between DAOS and MAOS audits. The combination of both audit types within one audit team may reduce both the MAA's resource needs and the regulatory burden on industry, although it is recognised that, in doing so, the audits themselves would become more intensive. Some organisations perceive themselves as setting the conditions for the audit programme rather than the MAA; the announced lead time for an audit can be significant, and some organisations seemed able to agree, at will, delays to the timings to meet their own requirements. The MAA may wish to consider the benefits of sensibly planned, analysis-led, unannounced or short-notice audits.

Recommendation: *The combination of DAOS and MAOS audit types within one audit team may reduce both MAA's resource needs and the regulatory burden on industry.*
Recommendation: *Consider the benefit of conducting unannounced analysis-led audits.*

3.2.11 Some stakeholders felt that the burden of their own assurance activities was becoming unmanageable, with a tendency to feel the need to audit and assure everybody who came into contact. Although recognising that, ultimately, it was for them to determine their own assurance comfort-level, they commented that it was hard to pull back from a perceived expectation of wide-scale assurance fostered by both the MAA and legal concerns. Multi-platform DHs suffered the worst, with multiple assurance activities sometimes swamping their ability to conduct their command roles. There was also concern that the proliferation of bow-tie and other risk assessment methodologies could foster an overly optimistic view of the dynamic 'health' of their SMSs, and that the MAA could be clearer on their associated vulnerabilities (recognised in other major-hazard industries). The issue being that over-reliance on such processes means that, if not used with a clear understanding of their limitations, they can start to lose focus, impact and value. In short, too much process as an outcome will lead to hitting the target and missing the point.

3.2.12 As the rapid momentum of its introduction eases, it may be time for the MAA to pause and look at whether the extensive assurance structure is still the most effective way of doing things versus the attendant resource demands, degree of effort involved, and the associated pressure overall on resources to actually deliver capability. The risk-based approach to auditing might help in this respect but this would require a two-way flow of information so that DHs had visibility of risk-based tools and could pro-actively address issues that the MAA might have perceived but they had not. It was not clear that the MAA habitually or transparently highlights risks that it has identified at its level to the community; the MAA had good access to the community's risks/issues but not vice-versa.

Recommendation: *Consider a cost-benefit review of overall DH assurance requirements, processes and structures to ensure that they are still the most effective way of doing things versus the degree of effort and attendant resource demands involved.*

3.2.13 The MAA's assurance of the SDHs and the auditing of the SDH's staff's own assurance of ODHs appeared to be an area that was somewhat open-ended. The Panel was informed that this was achieved via appropriate personal engagement by D MAA with each SDH, supported by oversight/assurance of the SDH's own assurance team. Although the Panel judged that this level of engagement is appropriate, SDH assurance of ODHs, and MAA assurance of SDHs was probably an area for more formal definition within the RDS.

Recommendation: *Consider the benefits of formalising SDH assurance activities of ODHs, and of MAA assurance of SDHs.*

3.2.14 MAA RTS audits include organisational maturity, but not whole-system from design to release. It was also asserted by some that there was a lack of MAA coordination in ensuring coherence of initial design assurance against endpoint delivery assurance. This could potentially result in TAA requirements not being implementable at the delivery point. Developing end-to-end assurance themes within the MAA, as opposed to the current stovepiped segmented view, would ensure a holistic approach to RTS assurance activity.

Recommendation: *Develop end-to-end holistic assurance themes as opposed to the current segmented approach to RTS assurance.*

3.2.15 Although MAA responsiveness seems to be good at the lower and senior levels, overall system response times are sometimes too long and opaque. Some stakeholders and companies also complained that there was no independent 'ombudsman' to arbitrate between MAA and stakeholder views when differences of opinion were evident at the middle-management level other than to escalate the issue to the 'nuclear level' of ODH/D MAA involvement. In short, given that the military operates in an extremely hierarchical structure, there was unease that there isn't always a 'safe place' to raise concerns regarding compliance. They also felt that the good levels of interaction and transparency at the lower and senior levels were not always replicated by the middle-management where, in their opinion, individual decision-makers seemed to hold something of an unaccountable veto, and were also a bottleneck at times due to their own workload. The Panel noted that there was a process for challenging MAA decisions but that not all stakeholders were necessarily aware of how to do so. Practically, the Panel were unsure who would provide an ombudsman activity given the specialist knowledge that would be required; it would surely be better if fuller transparency was achieved at all levels, perhaps through some form of regular OF5-level forum (akin to the MOC), and perhaps an annual conference/event for smaller stakeholders in the community both to allow better information flow and to answer concerns that there appeared to be little middle-management guidance and response to 'what good looks like' when applying regulations.

Recommendation: *Consider the introduction of an OF5-level forum to ensure fuller transparency at all levels, and an annual conference/event for smaller stakeholders in the community to promote better information flow and confidence.*

3.2.16 Finally, there were also concerns that some MAA regulatory processes may predispose the regulators and regulated community to view things only through the lens of current in-vogue practices (such as bow-ties and hazard models) when there was a need to ensure flexibility of thinking to ensure safe outcomes. In this respect, airworthiness and platform issues were comparatively easy to measure, whereas human factors issues were much harder to define and assure, and were the root of many safety issues that might not lend themselves to current methodologies. For example, some opined that there is a tendency for bow-tie and hazard models to look at things just through the lens of what might go wrong, as opposed to what had previously gone right, or 'right enough'. In short, over-reliance by DHs on bow-ties etc is a vulnerability that can distract DHs from focusing on outcomes. The chemicals industry learned this the hard way – Buncefield operators could point to an array of QMS accredited systems and 3rd-party audits that showed systems in place, but they didn't know whether they were being properly implemented, or that process deviations and change were actually being managed at the shop-floor.

3.3 Key Condition 2: Risk Based Assurance

3.3.1 The MAA needs to be able to determine with some level of certainty the overall improvement in air safety across the military aviation environment to inform its longer-term strategies and priorities, as well as how well individual DHs are managing and controlling risks. Although the level of compliance will always vary, an understanding of the baseline is a key enabling factor in order to progress to risk-based assurance, and an assumption of compliance in the absence of evidence to the contrary could result in priorities being

decided on incomplete or misleading information.[10] The Panel were interested to see how the MAA measures and examines levels of baseline compliance as it moves to risk-based assurance, and whether a gap-analysis had been undertaken. In order to test this, the Panel asked an interviewee if it was possible for the MAA to verify, through demonstration of the ASD, that ICAO requirements had been met at a specific airfield. However, the response was that this would not be available in ASIMS or the ASD, and there was uncertainty as to whether such information was even recorded or where it would be available. It was concluded that, in some cases, the MAA was assuming compliance in the absence of data to the contrary. In short, the migration to risk-based assurance requires the regulated community to be mature in terms of meeting compliance criteria as a foundation, but it is not fully clear that the MAA can demonstrate this yet due to lack of useful data and intelligence.

Recommendation: *An internal audit of information held within the ASD is conducted to ensure evidence against baseline of compliance is held against each relevant organisation/entity.*

3.3.2 The concept of the MAA's move towards risk-based assurance was welcomed by all as a potential positive step towards more intelligent targeting of scarce resources and a sharper focus on emerging problems. Recognising that attempting to predict and catch all risks before they emerge was unachievable, the key to success was the ability to detect trends and emerging themes early enough to apply countermeasures. However, there was uncertainty within the regulated community of the suitability of current processes to successfully deliver this. Risk-based oversight should be intelligence driven as opposed to being resource driven, and proper analysis and trending within an holistic picture should drive which elements of the regulated community are being sampled. There was some scepticism that the reasoning behind the decision to move to a risk-based approach was taken more because of resource issues than the maturity of the regulated community and the MAA's ability to deliver robust risk-based analysis with the tools currently at hand.

3.3.3 The MAA's current processes principally attempt to target resources to hazards and weaker performers by employing the ASD (which provides the key tool for reviewing organisational/platform risks based on manual data inputs and assessments from MAA desk officers), and 1-star led weekly 'bird table' meetings looking across sources of information from desk officers. A separate analysis cell looks across the 6 ODHs and 30

[10] As alluded to by EASA in their TE.GEN.00400-003 paper 'Practices for risk-based oversight' (RBO) dated 22/11/2016 wherein they comment on the 'Limits of RBO' as follows: *The traditional way of performing oversight has achieved such tremendous safety records that this should continue to serve as the basis on which RBO complements. RBO is not a revolution but an evolution of the current system, bringing alternatives, benefits but also drawbacks. In fact, in the early time of SMS implementation, some aviation regulators started to significantly replace the existing "prescriptive" system by a full Performance Based Environment (PBE) and experienced serious setback in term of safety records.* ***Compliance to the rules remains the foundation on which the Performance Based Environment and RBO can be built****. As an example, Canadian aviation investigation report A13W0120 highlights that –"If Transport Canada does not adopt a balanced approach that combines inspections for compliance with audits of safety management processes, unsafe operating practices may not be identified, thereby increasing the risk of accidents".*

DDHs through the 3 lenses of: air system, equipment and organisation. Having assigned a Risk to Life (RtL) level (0 to 4) to each area, the MAA response is then based on 3 tiers: 1) watching brief; 2) Stage 1 desk-based analysis of the subject SMS; or 3) Stage 2 in-depth audit. Risks categorised as 'red' on the heat maps receive an audit within 6-12 months, those categorised as 'amber' 12-24 months. Any subsequent interventions focus on confidence in the DH's 1st- and 2nd-party assurance outcomes.

3.3.4 However, the ASD is labour intensive, has no interface with the MAA prime data source (ASIMS), and seemed to be mechanised from an analyst's perspective as opposed to a user's requirement to rapidly search for and retrieve information in a holistic manner to identify cross-cutting themes across DHs, operators or platforms. In short, the ASD lacks a suitable user interface and does not appear to have much utility for automatic data-mining or connecting threads or emerging trends within its information set. Whilst the generation of risk 'heat maps' had some utility in indicating where the key risks may be, in reality they simply provide a visual display of what the desk officers already know, and accessing the data behind these assessments appeared to be extremely convoluted.

Recommendation: *Integrate all tools that hold source information to enable a level of automatic data-mining and decision support in order to provide the foundation for risk-based activity.*

3.3.5 A further challenge to realising the goal of risk-based assurance is that analyst staffs seemed somewhat stovepiped from the assurance and planning staffs, and there appeared to be few ASD linkages to the planned assurance programme other than desk officers generically referring to the various heat-maps. More concerning was the fact that known issues with some platforms (Sentry and Tutor) did not yet feature within the ASD, and key documents related to these platforms had not been uploaded some months after associated meetings; the data within the ASD appeared to lag reality to varying degrees depending on whether desk officers had had time to input to the system. In short, the ASD appeared to be very reactive and rearward looking; although there is ample information within the MAA to forecast and predict, this information appears to be very stovepiped and not easily brought to bear to bring the efficiencies and sharing that would enable the more proactive approach needed for risk-based assurance. That the ASD did not predict issues like Sentry, Tutor or the ETPS Yak accident gave cause for concern as to its value in its current form; as such, the ongoing investigation into how the Sentry situation arose may well shed more light on how the risk-based approach is maturing. However, of more concern was the fact that information was available within the MAA and the regulated community that was not reflected within the ASD. This echoes to some extent the situation that pertained ahead of the Haddon Cave Nimrod accident and so, although Haddon Cave processes have clearly been introduced as discerned in MEAP14, it seemed to the MEAP17 Panel that their practical effectiveness was not yet fully mature.

Recommendation: *Consider restructuring the MAA analysis team to reflect better the more integrated requirements of the risk-based approach as a cross-cutting activity.*
Recommendation: *Review the visibility and availability of information held within the MAA to ensure collaborative access across all areas of the MAA rather than stovepiped within specialisations.*

3.3.6 The MAA has the data available to successfully develop risk-based assurance but the current tools are significantly limited in their usefulness due to their manpower-intensive requirements for data input and mining, partly due to taxonomy differences across the MAA and the technical specification differences between tools. The lack of a collective view of a single organisation or air system within the ASD also inhibits the ability to ascertain the true risk picture of that organisation. The Panel noted that the MAA risk-based assurance initiative is similar to the UK CAA's performance-based regulation (PBR) concept, and the ASD bears similarities of intention with their associated Entity Performance Tool (EPT). CAA members of the Panel were able to provide outline information on the PBR/EPT concept and it appeared that, rather than developing systems independently, further cross-fertilisation of the latest ideas and concepts would likely be of benefit to both organisations.

Recommendation: *Consider further cross-fertilisation with other regulators (especially the CAA) regarding the latest risk-based ideas and concepts that would likely be to the benefit of both organisations.*

3.3.7 All that being said, moving to a meaningful risk-based assurance concept was supported by all respondents as a positive initiative in accordance with better regulation principles, and therefore fundamental, albeit recognised as challenging to achieve. All welcomed the concept as a positive step in transitioning from the current cyclical assurance processes, although some stakeholders warned of the dangers of losing an holistic oversight by focusing on high-threat risks 'A, B and C', as alerted by a risk-based approach, at the expense of routinely continuing to look at low-threat areas 'X, Y and Z' which may have undetected dormant risks within. There were also some concerns that, counter-intuitively, without appropriate tools to conduct the analysis and assessment of risks, the premature introduction of risk-based assurance processes may increase the burden and workload on the MAA and DH staffs as they go about their assurance activities compared to a simpler calendar-based, check-list approach.

3.4 Key Condition 3: Engaged Air Safety Culture

3.4.1 The MAA has adopted the term 'Engaged Culture' and, tailoring it for the Defence Air Environment, has accepted the following definition:[11]

> *An Engaged Air Safety Culture is that set of enduring values and attitudes, regarding Air Safety issues, shared by every member, at every level, of an organisation. It refers to the extent to which each individual and each group of the organisation: seeks to be aware of the risks induced by its activities; is continually behaving so as to preserve and enhance safety; is willing and able to adapt when facing safety issues; is willing to communicate safety issues; and continually evaluates safety related behaviour.*

3.4.2 Although the intent of assessing air safety culture for its engaged nature was laudable, what was really required was an 'effective' air safety culture not just 'engaged'. Although

[11] MAA Manual of Air Safety (MAS) Issue 5 Ch 3, Para 3 (pp 28-29).

stakeholders felt that an engaged air safety culture had evolved well in recent years, was moving in a positive direction (and continues to do so), there remained concerns that simple adherence to process itself may become a barrier to actually preventing incidents from becoming more likely. For example, the previously mentioned shortcomings of Sentry were well known but, despite seemingly comprehensive and 'engaged' reporting from various areas over the years, the issues had not been recognised earlier in the journey. As in other high-risk sectors, people sometimes become so focussed on the high-tariff issues that they forget the basics and so discount them from their thinking whilst they become embroiled in dealing with high-visibility concerns.

3.4.3 More tellingly, some stakeholders were not convinced that air safety culture was as good as it seemed. They were worried that the prevalent culture was more about serving the process than questioning things that did not look right, on the basis that a safety management system is only as good as its weakest link. They opined that simply formulating bow-ties and ensuring high levels of DASOR submissions did not in themselves say anything about how good culture might be, and instead risked becoming something of a process-focussed comfort blanket that potentially stifled the ability to think outside the box and look at safety from a different, holistic perspective. In short, they felt that too much effort and overreliance was being attached to the process of servicing bow-ties, risk registers *et al,* rather than actually defending against the vulnerabilities themselves. Instead, they felt that the MAA should focus the community on the key pillars that support an effective air safety culture and promote those rather than simply servicing or building more processes that reflect on levels of engagement. In short, the MAA should encourage the community to ensure that more cultural emphasis is given towards achieving safety outcomes rather than a culture of serving the processes themselves.

Recommendation: *The MAA should encourage the regulated community to ensure that more cultural emphasis is given towards achieving safety outcomes rather than a culture of serving the processes themselves.*

3.4.4 The effectiveness of the air safety culture needs measuring, but many stakeholders were unsure how this could be done other than subjectively. They also recognised that the hierarchical rank structure of the military presented particular problems in measuring culture because subordinates naturally wished their seniors to see them as 'can do' followers of contemporary safety fashions rather than safety 'heretics' or 'whistle-blowers' who might be perceived as bucking against the system and having a 'poor' safety culture through questioning its validity or highlighting concerns. Almost all respondents could describe a 'good' safety culture, but the Panel were surprised by comments from some that 'safety culture cannot be assessed; it's too difficult to do'. Notwithstanding the problems associated with its measurement, major-hazard and other industries have experience in triangulating their safety climate with other indicators to assess culture, and the MAA could usefully investigate these to develop a tool by which to objectively measure its progress in promoting a good safety culture.

Recommendation: *The MAA reviews efforts to assess safety culture in other sectors to seek best practice and develop a tool to objectively measure air safety culture.*

3.4.5 The MAA's own methods for auditing leadership and overall commitment to safety were not clear to the Panel, nor was it obvious how the MAA's cumulative view of safety culture and SQEP was assessed over the entire air domain, other than subjectively. Although the MOC provided a forum for D MAA and the ODHs to share views, this was informal and focused on ODH subjective perspectives. D MAA provides an overarching perspective on safety culture to DG DSA within his annual reports,[12] but the most recent was focused on levels of reporting within ASIMS rather than an assessment of culture *per se*, or any wider issues across all ODHs (for example, 4 out of 6 ODHs were fairly new in post at the time of the audit but this did not appear to factor into any view of how culture or risk might be impacted overall, nor how this might be articulated to the SDHs). As the conscience and guardian of safety culture within the air environment overall, the Panel felt that more could be done by the MAA to triangulate cultural intelligence gleaned by desk officers during interactions with the regulated community, assessments made by DHs of their teams, and levels and quality of reporting activity within ASIMS.

Recommendation: *MAA to consider how to engage with DSA, SDH and ODH staffs to develop comprehensive pan-environment measurements of safety culture and safety leadership effectiveness.*

3.4.6 Finally, although the MAA has clearly created and led a positively developing air safety culture that continues to evolve, the MAA is perceived at times by some as not being a particularly customer-focused, listening organisation in itself. Some stakeholders reported inconsistencies in approach depending on who was contacted, and too much 'speak to the hand' versus 'proper partnership' in developing close liaison relationships with the regulated community outwith the regulating/assurance cycle. There will undoubtedly always be unfortunate clashes at times, but the frequency of this observation was indicative that a more productive, customer-facing approach would be beneficial in promoting a co-production mentality of mutual respect and shared endeavour.

3.5 Key Condition 4: Recognition. Cooperation and Reputation

3.5.1 The Panel noted that the MAA's recognition amongst other aviation regulatory bodies is positive and growing, and that within the UK military environment confidence and acceptance had increased over the last few years, especially as staff flow back to the front-line units and vice-versa. All DHs responded that the MAA had proved to be a credible regulator, had an ongoing and critical role in securing the effective management and control of air safety risks, and that they would feel quite vulnerable if it was not there.

3.5.2 Senior levels of the regulated community recognised the importance and openness of the MAA, and were clear that DH-ing had changed for the better over recent years: they felt that regulations have improved, were more transparent and less of a burden; most DHs felt engaged during the major regulatory changes at least; and all commented that the MAA had quickly evolved over the last few years into a fairly mature and collaborative organisation, certainly at the senior levels. However, there was a perception at the lower

[12] D MAA Defence Air Safety Annual Report – 1 Apr 16 to 31 Mar 17: dated 3 May 17.

levels that there was a bottle-neck at the middle, decision-making level which caused delays and sometimes overrode their agreed positions without sufficient transparency. Some respondents, especially within industry, also worried that there was not a sufficiently open and collaborative relationship at the lower levels, and that interactions were sometimes a bit clunky and transactional rather than being agile, dynamic and easy. However, although it appeared that the relationship was inconsistent across the regulated community, most respondents felt that the MAA was pragmatic and cooperative overall, and much more supportive than in the past.

3.5.3 With regard to stakeholder engagement, the Military Operators' Council (MOC)[13] and Joint Air Safety Committee (JASC)[14] were intended to provide high-level forums for consultation with ODHs and Industry respectively. Most MOC attendees commented that the meetings could be more valuable and effective if there were more free-flowing, richer discussions that were more forward-looking in addressing emerging issues rather than being largely reactive to recent events. That being said, they also acknowledged that because DH structures were still establishing themselves in a quickly evolving current environment, there was a certain inevitability that discussions would focus on the here-and-now rather than future issues. Noting the valuable participation of DE&S in the MOC, some ODHs wondered whether the span of MOC attendance could usefully be widened to include some of the DH-facing organisations, especially DIO, in order to assist them in understanding their responsibilities to the DHs within the Air Safety domain.

Recommendation: *The MAA consider re-baselining the MOC's purpose and also widening its attendance to include key DH-facing organisations such as DIO.*

3.5.4 Although understanding the roles and responsibilities of DHs had much improved over recent years, some stakeholders commented that the changing safety environment across Defence (i.e. DSA standing up; the brigading of Regulators; and the relative maturity of the aviation regulated community) had created some second-order effects most notably in the training area. They opined that the origins of DH training delivered by the MAA from the Haddon Cave recommendations was becoming blurred and losing its purity of focus. The well-developed DHASC appears to have morphed into a generic air safety education course for too wide an audience that does not now focus specifically on DHs as originally intended; whilst there was undoubtedly a role for wider training, some DHs opined that the DHASC needed to be refocused onto their specific needs as the ultimate risk holders.

Recommendation: *A broad review of safety training requirement should be conducted across Defence to identify safety training needs and allow the MAA to refocus DHASC.*

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[13] The MOC is the MAA's highest level consultative body. It facilitates senior stakeholder engagement on air safety regulation, policy and standards; highlighting any enterprise level air safety risks and considering potential means of their mitigation. The MOC aims to enhance defence understanding of the risk to life being carried at the aviation Operational Duty Holder (ODH) level and above.

[14] The JASC supports and informs the MAA Executive Board (MAB) on military air safety issues through consultation with the aerospace industry. It is supported by advisory groups (AGs) established to cover specific areas of military air safety regulation.

3.5.5 Through interviews, it was clear that the regulated community wanted guidance on best practice and 'what good looks like', and that they perceived this was not always forthcoming from the MAA. Some stakeholders reported a desire for a MOC-like forum for general feedback into the MAA at desk level so that they could raise their own issues and challenge the MAA on contemporary matters of the moment. For example, consistent interpretation and application of regulations was cited to the Panel as an issue by the regulated community, and this was further aggravated by the perceived high churn rate of MAA staff which was a universally reported problem that needed to be addressed. To fill this space, ODH safety teams have developed a network to bounce ideas around, but this is self-generated, usually with HQ Air Command safety staffs as the default coordinating body due to their preponderance of ODHs, and not MAA-led. Although there is something of a tension between being a regulator and a flexible advisor, there may be value in holding a semi-annual desk-level workshop intended to at least clarify the rationale behind forthcoming changes or recent issues, provide a focus for communication with the regulated community at desk level, and provide a direct feedback process to critique MAA performance and the perceived regulatory burden. Although there were a number of MAA Advisory Groups held with ODH CAEs, the perception was that the dissemination of information was not robust and was missing its target.

Recommendation: *Consider holding a semi-annual desk-level workshop intended to clarify the rationale behind forthcoming changes or recent issues, provide a focus for communication with the regulated community at desk level, and provide a direct feedback process to critique MAA performance and perceived regulatory burden.*

3.5.6 Industry stakeholders opined that recognition within the MAA of other regulatory standards was not coherent and that the MAA was not sufficiently flexible in acknowledging and applying standards other than DefStan 00-970. The support area was quite direct in challenging the flexibility of the MAA in acknowledging and applying standards other than DefStan 00-970, particularly as more and more procurements are of airframes already in service elsewhere in the world and simply receive some modifications for UK Defence duties. The rigid application of DefStan 00-970 was felt to be bureaucratic, whereas it was thought that the MAA could work with other aviation regulatory bodies and only regulate the delta between the standard already applied to the airframe and DefStan 00-970. Similarly, industry was clear that the rigidity of MAA process did not optimally recognise their role (particularly in respect to corporate liability and reputation), which meant that industry could be given more responsibility in the application of standards. Within the context of such greater responsibility, the application of EMARs would enable privileges to be given to industry (e.g. certification and classification of modification/repairs in the Typhoon program), which some auditees felt was lacking at present. A more stringent application of EMARs and the respective privileges could reduce the effort on MAA's side and is fully embedded in the concept of risk-based assurance.[15]

Recommendation: *Review the policy towards application of Def Stan 00-970.*

[15] At the time of MEAP17, the MAA RA5000 series was under review and in transition; the Panel understands that the new RA5000 series does enable industry to receive privileges, with TAA approval.

3.5.7 The widespread regulatory changes introduced by the MAA have been mirrored in the civilian environment as air safety has matured worldwide, and there was good evidence both of sharing ideas internationally and a useful degree of interaction with the CAA. Notwithstanding, those operating in the mixed civil/military environment commented favourably about the CAA's regulatory systems, and opined that there was much that the MAA could learn from CAA strategy, processes and procedures. Some reported a perception that the MAA felt it was too different to the CAA, and that this was a barrier to harmonising activities; although the two regulated communities are different, there is commonality of the oversight mechanism that is used, and there is opportunity to harness best practice from both the CAA and the MAA. The consensus was that there was more that could be done to leverage resources and ideas in both directions between the MAA and CAA. The opportunity for secondment by SME's may enable the development of SQEP (targeted at those who are likely to be in the MAA for the longer term/tour.) There is also currently a degree of duplication when interfacing with the contractor-regulated community, and this could be rationalised such that surveyor workload is balanced and accurate metrics for manpower planning become available through the use of common systems for planning and scheduling of oversight activities. Given that there is an MoU already in place, sharing of intelligence (subject to contractor organisation agreement) might also allow for a better risk picture to be developed by both organisations.

3.5.8 Notwithstanding, although the pursuit of harmonisation was a laudable goal, the inherent flexibility within the military operating system in allowing commanders to take operating risks that would not be permissible in the civil environment was a benefit that all DHs sought to retain. The counterargument to such flexibility was a concern by some that, because operations outside the regulations were possible by DHs accepting risk, there was a perception that waivers sometimes took considerable time to be granted because MAA staff knew that operations could continue irrespectively.[16]

Recommendation: *More liaison and cooperation between MAA and CAA in order to maximise resources, reduce oversight activities and share best practices.*

3.6 Key Condition 5: Structural/Resource Agility

3.6.1 The Panel were briefed that at the time of the audit only 184 out of 218 MAA posts were filled (84% staffing level). As a result, the MAA was forced to focus on here-and-now activities rather than forward-looking future programmes. Also, the stripping out of some MAA SMEs to stand-up DSA meant that the rate of regulatory updates had necessarily reduced. In particular, D MAA briefed that he had recently taken more risk on CAMO activities due to the need to terminate some assurance activities due to lack of resources.

3.6.2 Many external stakeholders (and internal staff) felt that the MAA structure appeared complex, obscure and stovepiped, and did not appear to interface well with their own structures; some stakeholders did not know who they would contact within the MAA for a

[16] A positive example of flexibility was being able to continue Voyager military flying into Ascension Island when the runway become unsuitable for civil regulations; the negative was that a waiver for Middle Wallop using non-compliant lighting had taken a year to process and flying had had to continue under DH risk.

specific problem, or which area might address their issues. There was also a feeling that stakeholders had to 'reach in' to the MAA as opposed to the MAA 'reaching out' to them in a customer-focused manner. This contrasted with CAA experience where a 'portfolio manager' approach meant that stakeholders had a defined customer-attuned focus and, more importantly, consistency in feedback and dialogue tailored to each entity. It was noticeable that organisations that interacted with both the MAA and the CAA reported a better rapport with the CAA, who they felt offered best practice as a customer-focused organisation. The Panel was not in a position to make comparisons, but perception is often reality as far as stakeholders are concerned and the MAA may benefit from reviewing CAA operating practices and procedures to identify whether there are advantages to be gained from adopting an account manager/portfolio model.

Recommendation: *Develop a portfolio manager/liaison officer position between the regulated community and the MAA at desk levels.*

3.6.3 The MAA also appeared to many stakeholders to be somewhat process-driven rather than outcome-driven, and had been slow to respond to innovative changes in the aviation environment such as the introduction of the civil/military Voyager model and the specific regulatory issues associated with unmanned aircraft. Although these two specific issues were now showing good progress, it seemed to stakeholders that the MAA had initially tried to shoe-horn them into current processes rather than approaching them with agility and lateral thinking. This may be a result of resource constraints, wherein MAA staffs were clearly perceived by all to be running hard simply to maintain the status quo rather than addressing future regulatory challenges or adopting new regulatory models as risk-based assurance matures. There were, however, differing views on whether simply providing more resource (manpower) was the solution rather than an intelligent restructure of the organisation away from the perceived stovepiped structure into a more outcome-focused model. A more intelligent partnership maybe the way of solving ODH and MAA resourcing problems by slimming down the process. During the audit, numerous respondents touched on MAA resourcing with a surprising spread of views ranging from 'clearly seriously undermanned' to 'overmanned but personnel are in the wrong areas'.

Recommendation: *The MAA reviews current manning and structures to embrace risk-based assurance and potentially offer efficiencies in employment of resources.*

3.6.4 It was notable to the panel that there is a shortfall in personnel to support the current task model and commitments: e.g. the oversight process of MAOS, CAMO, and DAOS is labour intensive and the outputs via formal reports seem to go beyond what is necessary, where key summarised findings would suffice. Additionally, the Panel noted that the numbers of CAMOs seemed excessive to support the current military fleet compared with civil operator fleets. An evaluation of the current model compared with civil oversight would be valuable, especially since the current oversight model does not look sustainable considering the growth of approval numbers versus the number of posts.

Recommendation: *Review the current CAMO structure to see whether rationalisation by activity or class of aircraft is more suitable than by aircraft type.*

3.6.5 The mix of Military and Civilian personnel in the MAA has clear advantages and disadvantages with the churn of military turnover being balanced by the longevity of civilian staff. There is though a clear need to look at the Military staff from the view of tour length, qualifications and achievement of competence to act for the MAA. Some military staff are in post for barely two years, and there appeared to be both civilian and military staff in place for expediency rather than for the advantage of the regulator. For Service personnel, the current tour length makes it challenging to achieve SQEP such that the individual makes a positive contribution to the MAA before moving on to the next assignment. An example is CAMO / MAOS where it takes typically 12 months to become SQEP in CAMO, and 6 months for MAOS. This does not represent a good investment because the time achieved as 'Fully SQEP' is short, with some overtly criticising the lack of 'E' in some MAA staff's SQEP.

Recommendation: *Review military personnel selection and training process to gain full value from tour length.*

3.6.6 The MAA structure is still very much based on the original concept, and the changes brought by moving the organisation under DSA has also created some tensions. More directly, it appeared to the Panel that the formation of the DSA (and subsequent removal of the MAA's 3* head) has 'squashed' the MAA top-level structure and potentially confused the lower levels. The draw the DSA has on the MAA manpower resource was also adding uncertainty to future resource levels that risked hampering the restructuring of an internal organisation that has remained too stovepiped to facilitate effective risk-based assurance. Structurally, the MAA appears top heavy with two 2-stars, three 1-stars and six OF5 graded posts. Notwithstanding, there were also clear indications of some personnel being particularly stretched, and the rotation of military posts at anything from 15 months to 2 years verses the longevity in civilian positions added to the stress and challenge. All of the above point to a clear requirement for a root-and-branch review of MAA's structures and resources as it adopts the risk-based approach.

3.6.7 With regard to the impact of the formation of the DSA, stakeholders were divided on whether this was an opportunity or a threat to the MAA. On the one hand, it was recognised that there were clear advantages to be had in providing a single focus for safety across Defence for highlighting and sharing best practice across the various safety domains. However, there were serious reservations that the MAA's hard-won purity of aviation safety focus might be lost as experience leached from the MAA due to DSA demands in other areas; in this respect, the Panel were reminded of one of the fundamental concerns of the Haddon-Cave report regarding the potential dilution of Air Safety if it becomes subsumed within other structures. However, as the formation of the HQ Air Command Safety Centre had shown, this did not mean that the 2 regimes needed to be completely isolated from each other; provided that suitable checks and balances were in place, a suitable aviation safety focus could be maintained within a Total Safety structure. That being said, it was evident that the DSA role has added some complexity to the MAA task. Although some MAA support personnel have moved to the DSA, some duplication remains in the MAA and there is also the added complexity of the MAA DTech role having a function that is more–and-more DSA as opposed to MAA.

3.6.8 On the topic of DSA as a focus for safety issues, some respondents returned to the theme of how to separate better the MAA auditor/enforcer activities from those of co-production partner providing guidance on policy, processes, training and 'what good looks like' in general safety terms. A number of military stakeholders offered views on the establishment of a DSA 'Defence Safety Centre' that might provide a focus for best practice across Defence for guidance and training on generic safety process management and the development of safety 'doctrine' (such as bow-tie processes) that would benefit not only the MAA but also the other safety environments. Although it was not for the Panel to recommend this route themselves, establishing such an organisation would assist the MAA in developing its regulatory ethos by devolving much of the 'guidance' and training function to the Defence Safety Centre and thus allowing clear water between this element of the MAA's work and the auditing/enforcing function. MAA workload and structures could benefit as a result, as would the Front-Line Commands who could also devolve some of their activities and resources to this shared endeavour and focus.

Recommendation: *Press for clarity on the DSA future structure and applicable responsibilities in supporting the regulator – alongside the DSA review the supporting functions and create a clear break after review of either retaining or completely de-latching support, relying on DSA to provide core support functions.*
Recommendation: *Conduct a root-and-branch review of MAA structures and resources in the context of adopting a risk-based approach.*
Recommendation: *Consider the formation of a Defence Safety Centre.*

3.7 Key Condition 6: Effective Knowledge Management and Information Exploitation

3.7.1 Effective knowledge management and information exploitation hinges on the ready availability of relevant data and the fusion of that data into actionable information. The Panel noted that the MAA had two principle sources of safety data: ASIMS, which is the repository for DASOR occurrence reporting; and the ASD, which was a tool intended to provide a focal point for information gleaned from interactions between the MAA staff and the various stakeholders.

3.7.2 With regard to ASIMS, the fidelity of some data appeared to be questionable not least due to inconsistencies with taxonomies used in earlier[17] data sets; as a result, ensuring coherency of data was an issue for analysis purposes. Furthermore, although ASIMS provided a reasonable starting point for analysis, data retrieval was manually intensive and better outputs would be achieved by employing automated data-mining tools to fully exploit the data set using artificial intelligence methods: given the limited manual ability to fully analyse the circa 13000 DASORs each year (50 per working day), discover threads and develop a bigger picture, the success of the MAA's risk-based assurance process probably hinges on their introduction. Such enhancements would require significant investment (probably by a commercial developer) but other regulators may have similar

[17] Such as the 165,000 reports imported from the previous PANDORA system (which only contained top-level summary details), and previous versions of ASIMS which used different taxonomies to the recently released V3 (58000 reports have been raised since ASIMS went live in 2012, and 16000 have been raised since V3 in April 2016, which have significant taxonomy changes.

tools that might provide utility. In short, the MAA is capturing a lot of data, but it is not clear whether all of that data is either available, properly integrated or being applied effectively to conduct risk-based assurance. However, in modernising the ASIMS system, the MAA also needs to guard against generating burdensome safety bureaucracy that detracts from making things easy to do. For example, the DASOR tool was widely considered by many stakeholders to be too cumbersome and process-bound compared to its value; system utility and time saved should be key considerations in a revised system. Finally, access to ASIMS by the regulated community and industry is still not optimal due to its MOD-hosted nature. The MEAP14 Panel commented on this in their report, and the MEAP17 Panel reiterate that an App-based, www-hosted tool would improve access, usability and effectiveness for those stakeholders who do not routinely have military IT access, or who are deployed away from such access for short-term activities.

Recommendation: *Improve the integration and usability of ASIMS and the ASD.*
Recommendation: *Introduce internet-based ASIMS as per MEAP14 recommendations.*

3.7.3 As far as the ASD is concerned, the current tool is not best configured to exploit either ASIMS outputs or staff-input intelligence data. Although it appears to have some potential, the ASD is a staff-focused analysis tool rather than a command-focused risk-management tool able to easily interrogate artefacts or drill down through the dashboard to examine safety issues. Fundamentally, the ASD relies heavily on reported information being input by MAA staff and therefore provides only a lagging response rather than the horizon-scanning, leading-indicator intelligence that is needed to allow the MAA to move to risk based activity. A significant limitation is that the ASD does not interface electronically with ASIMS; although they hold plenty of data between them, there is not a common taxonomy, and this means that the information is not used to best effect because data mining / retrieval is very manually intensive. In short, although the ASD may be useful for prioritising some audit activities on a manual basis, it does not join the dots, and is not particularly well mechanised for highlighting emerging issues.

3.7.4 Disappointingly, when the Panel looked at the ASD to examine known issues such as the Sentry CAMO problem and Tutor engines, the ASD still indicated no problems with these areas and displayed them as ‘Green’ on the associated heat maps. Furthermore, the latest Sentry CAMO report for March still wasn’t in the system, and the Tutor engine problem didn’t feature even though it was a known issue to staff officers. This led the Panel to worry that the ASD was more of a process monitoring tool than one that could effectively target the correct intelligence to reduce RtL.

3.7.5 Additionally, it seemed sub-optimal to the Panel that the ASD was isolated from the regulated community; currently, only MAA staff officers have read/write permissions to input data from ASWGs etc, not DH teams; the MAA had full access to DH risk-registers but access to the ASD was not given in return. Accepting that there are some necessary confidentiality issues, if cascaded beyond the MAA in some form (not necessarily as full access to the ASD), DHs could usefully gain from visibility of the MAA’s concerns and overall risk picture to modify their own activities. However, it is recognised that such sharing would require a high degree of trust and mature interaction between the MAA and the regulated community. This theme was played back by a number of stakeholders who

felt that although they were well connected within their own areas, they had yet to gain experience of any substantive connectivity to the MAA's risk picture.

Recommendation: *Consider sharing ASD input and access with the DH-levels.*

3.7.6 The ASD should provide the easily accessible 'front-end' to knowledge management within the MAA. However, its full potential cannot be realised until it is properly linked to ASIMS and has at least partially-automated data-mining tools to highlight themes and issues. The Panel were told that this was an aspiration for which funding was not available; this is short-sighted. Although financial benefits and lives saved through the prevention of accidents is hard to quantify, the ASD/ASIMS linkage and future development is fundamental to the MAA's move towards a mature risk-based process.

Recommendation: *Introduce automated data-mining and analysis capabilities to the ASD/ASIMS tools.*

3.7.7 Analysis is the key to risk-based assurance, but the immaturity of the ASIMS/ASD tools seemed to lead to analysis activity being channelled into issue-based stove-pipes as opposed to development of end-to-end themes and wider horizon-scanning. The analysis team structure seemed to promote such stove-pipes, and the Panel felt that there was scope for wider integration of analysts throughout the MAA as a more federated approach to convert the substantial volumes of data held at desk level into useful intelligence for oversight and assurance planning. The MAA focuses analysis through the four lenses of: Organisations; Activities; Equipment; and Systemic. Although there are some useful tools and processes in place between Analysis and O&A and A&P teams, the Panel thought that they risked focusing too much on the here-and-now risks (as perceived by MAA staff) versus the bigger picture (e.g. understanding which regulations are attracting most CARs; maturing analysis of audit outcomes; and establishing common themes from SIs[18]). This ability to look more broadly suffers from lack of resources (not helped by their 'Surveillance Team' being taken by DSA) and the Panel noted that there were some digital posts that were vital to activity and therefore at risk when people move on.

Recommendation: *Review the structure and integration of the MAA analysis team.*

3.7.8 Finally, although recognised as an issue for DSA, now that the DAIB had moved under their remit DHs were very concerned about the timeliness of sharing vital information from ongoing SIs. Although the issues of investigation confidentiality and legal requirements were well understood, the unanimous view was that the slow exposure to SI recommendations had a safety implication that frustrated the DH chain who wanted to act quicker to prevent repeat incidents rather than wait for SIs to formally report.

Recommendation: *Influence the DSA to facilitate the quicker circulation of critical information from SIs so that DHs can address safety issues earlier.*

[18] For example, the recent Yak SI had reportedly exposed themes and issues regarding culture that they had seen before in other elite units.

3.8 MEAP14 Residual Recommendations

3.8.1. DMAA asked the MEAP17 Panel to review progress on recommendations made in the MEAP14 report. The following table summarises the key MEAP14 recommendations and comments on their status as perceived by the MEAP17 Panel.

MEAP14 Recommendation	MEAP17 Comment	Status
Para 8.1a There is a need for a clearer articulation to the regulated community of the outcomes the MAA is working to deliver in terms of air safety – What would success look like? – What metrics would enable the MAA to know it is making progress towards these outcomes?	MAA 5-yr strategy addresses this issue by articulating Strategic Outcomes and Key Conditions but it was not clear that these are regularly being reviewed or reported as part of the MAA day-to-day activity. The MAA should ascertain from the regulated community whether the 5 year Strategy takes the MAA in the correct direction.	Partially Achieved
Para 8.1c It is important that the MAA's senior leadership team understand and articulates the risks to achieving its outcomes. There was evidence that horizon scanning for emerging risks is taking place. This will need to continue to be prioritised and resourced.	MAA Risk Register articulates risks to achieving outcomes. Horizon-scanning had stalled due to manpower gapping; however, work had once again commenced within the Strategy Team.	Work in progress under continuous development.
Para 8.1d The planning process should be more responsive than at present and there should be a clear link to the strategic risks, aligning resources to these with a clear line of sight to outcomes in staff objectives.	Timing of the MEAP17 audit precluded witnessing the Command Battle Rhythm in progress, where this is discussed.	Unassessed
Para 8.1e The planning process should move to increase its focus on outcomes not process – enabling staff and stakeholders to see the big picture.	Repeated finding during MEAP17, the transition to risk-based assurance requires a further update to the planning process.	Work in progress under continuous development.

MEAP14 Recommendation	MEAP17 Comment	Status
Para 8.2b As the organisation develops and its approach to regulation becomes more sophisticated it will need to develop and embed a mechanism to enhance the evidence base underpinning its proposed regulatory decisions. This is likely to involve enhanced analysis of the data the MAA hold and further refinement of the ASD. The MAA should continue to explore alternatives to regulation and consider approaches that enable regulated entities to 'earn recognition' for the measures they adopt in managing their approach to compliance	MAA needs to be confident that DHs are performing to the extent that earned recognition is appropriate and performance can be clearly demonstrated. MAA also needs to be confident that its intelligence, information and regulatory systems can reliably identify where earned recognition is appropriate, and where it is not, so that they can intervene quickly. The Panel did not think that the MAAs systems and processes were yet able to support either criteria.	Work in progress under continuous development.
Para 8.2c The MAA should consider developing its own consistent approach to Regulatory Impact Assessment to better inform its decision-making. This would enhance its understanding of how decisions will contribute to the achievement of stated outcomes and the costs and benefits of the options available. Whilst it is acknowledged that Annex A to MAA03 affords the regulated community the opportunity to comment on what the MAA has opined to be the possible impact of a proposed amendment, there was no discussion of how such impact is weighed against the assumed benefit of the proposed amendment.	Also recognised within MEAP17 although many stakeholders commented on the improved access they had to revision of RAs. That being said, smaller entities still commented on the disproportionate effect that changes can have given their limited resources.	Work in progress under continuous development.
Para 8.4e Current focus of realising benefit of foreign military authority recognition is aimed at development of a long-term model that will apply to all future cases. This is a very complex situation, given that apart from universal adherence to a common set of design airworthiness criteria, standards and methods of compliance (for example the European Military Airworthiness Requirements), a single "Rosetta Stone" of translation between sets of requirements will perpetually remain elusive. Given the variety and complexity of cases, it is recommended that consideration be given to case-by-case approaches to enable learning through experience with a long term objective of a generalised approach that permits tailoring.	As eluded to in the original recommendation, this will be an ever-evolving process.	Work in progress.

MEAP14 Recommendation	MEAP17 Comment	Status
Para 8.4f To enable scarce SQEP resources to be focussed on the most important issues, Certification effort should be prioritised on the 'UK military delta' between UK military requirements and civil or foreign MAA certification and on issues that will have the most significant impact on air safety and risk to life rather than regulatory requirements for which non-compliance does not pose risk to life.	See report para 3.5.6, repeated finding during MEAP17.	Work in progress.
Para 8.4g The MAA should examine the possibility of delegation of design approval to DAOS approved organisations. It is presently unclear to some DAOS approved organisations the value of achieving approved design organisation status when the proof of design substantiation is still a requirement under DE&S contracts.	See report para 3.5.6, repeated finding during MEAP17.	Work in progress.
Para 8.4h The regulated community values the consistency of decisions and positions emanating from the MAA, though at times at the cost of slower responsiveness and speed of decision-making. Consideration should be given to delegating decision-making on lower risk exemptions, waivers and derogations.	See report para 3.2.15, MAA responsiveness remained an issue for some stakeholders. In particular, there was a perception that the middle-management layer was often a bottleneck and sometimes unaccountable.	Work in progress.
Para 8.5 The MAA should consider appropriate recruitment and retention policies while balancing the need for relevant current experience with SQEP needs coupled with the regulated communities' need for consistency.	See report para 3.6.5, repeated finding during MEAP17.	Work in progress.
Para 8.6b Further consideration should be given to how the MAA could make better use of this data, by applying further analysis to enhance its approach to strategic and operational planning and to ensure these are based on an understanding of risk.	MEAP17 also commented on the value of data analysis tools and their integration overall. The MAA risk-based approach will need to address this if it is to be effective.	Work in progress.
Para 8.6d Consideration should be given to exploring how data could be shared with the regulated community from the ASD to improve transparency.	See report para 3.7.5, repeated finding during MEAP17.	Work in progress.