NOTICE OF PROPOSED AMENDMENT (MAA-NPA-14/14)

TITLE OF PROPOSAL:
NPA for Review of Remotely Piloted Air Systems (RPAS) Regulation

Stage of policy development:	Consultation

MAA-NPA Serial No:	**14/14**		
RFC Serial No:	MAA/RFC/2014/229 (RPAS Engine Shutdown & Flight)		
MAA Originator:	MAA-Reg-Caw3-CAM	Redacted	Date: 09/10/2014
MAA Supervisor:	MAA-Reg-Dp Hd	Redacted	Date: 09/10/2014
MAA Independent:	MAA-Reg Hd	Redacted	Date: 09/10/2014
Date of Impact Assessment preparation:	N/A		

Affected Publication: (including paragraphs)	MAA02: MAA Master Glossary MAA03: MAA Regulatory Processes (Annex F) RA 1120 Military Aircraft Registration RA 1600 RPAS RA 2130 Safety Equipment, Survival Drills and Training RA 2310 Role Specific Fixed Wing RA 4050 Continuing Airworthiness of RPAS. RA 5002 RPAS Design and Modification Engineering (DME)
Cross-reference to other relevant amendment proposals or documents:	RPAS updates to the 2000 Series (Fly) were incorporated in the end-to-end rewrite notified via Notice of Approved Amendment (NAA) 14/02, effective from 2 Jun 14.

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Part 1 (for issue to Regulated Community)		

INTRODUCTION

The aim of the review of RPAS regulations is to 'normalise' the regulation of RPAS in the MAA Regulatory Publications (MRP) in order to create a more proportionate regulatory regime. The scope of the review is to address the accuracy, relevancy and coherency of extant regulation. Particular attention has been paid to the utility of implementing a classification framework for the regulation of RPAS and of determining the regulations which would be appropriate/applicable to each classification based on a determination of the likely Risk to Life (RtL) posed. Where duplication, omission, incoherence, ambiguity or unnecessary regulatory requirements were identified in the MRP, the relevant RAs have been amended, consolidated or new regulation introduced.

SUMMARY OF PROPOSED AMENDMENT

Change:

MAA02 has been amended to standardise those definitions related to RPAS.

MAA03 has incorporated a new Annex (Annex F), describing the proposed categorization process and the actions required by the Regulated Community (RC).

RA 1120 is amended to reflect the introduction of RPAS categorization and its affect upon Air System registration.

RA 1600 is a new RA and is designed to be the RPAS 'capstone' regulation, acting as a signpost to other relevant RPAS regulations. It introduces a proportionate classification scheme for RPAS, allowing greater flexibility in the application of such regulations. Ultimately, this ensures appropriate and proportionate regulation to ensure that RPAS are safe to operate and are also operated safely.

2000 Series: NAA 14/02 addressed many RPAS-specific issues raised by the RC. As such only minor amendments to the 2000 series RAs have been required.

RA 4050 is a significant amend to the extant RA and defines the continuing airworthiness responsibilities and requirements for RPAS, based on the proposed categorization scheme.

RA 5002 is a new regulation and addresses the responsibility and authority for design and modification of RPAS through either Service or contractor organizations.

Impact Assessment:

The review was not carried out in isolation and significant consultation has taken place with Subject Matter Experts representing key stakeholders from the RC in order to draft the reviewed regulations.

The MAA recognises that the RC will not be in a position to immediately comply with the new RAs when they are published. It is proposed that a scaled path to compliance will be adopted in order to provide an appropriate transition period for the RC to meet the requirements of the new RAs, in particular the requirement to categorize RPAS (and the associated categorization process). Details of this phased path to compliance will be published with the final NAA (due to be released in Dec 14) following NPA feedback from

the RC.

Objective:

To clarify and update the RPAS regulatory regime to ensure it is relevant and proportionate to the RtL that an RPAS presents.

Risk Assessment:

The proposed changes provide the RC with a more flexible and scalable set of regulatory requirements that can be tailored appropriately to the RPAS and intended usage.

Courses of Action:

Do Nothing:

Would leave the RC with outdated documents which do not account for developments in the RPAS environment.

Partial amendment:

As above.

Full amendment:

'Normalisation' of RPAS regulation in the MRP, and the creation of a categorization scheme, to create a more proportionate regulatory regime.

Preferred Course of Action.

Adopt new regulations in full

Organisations/business sectors affected:

RN, Army aviation, JHC, RAF, JFC, PJHQ, DE&S, all military HQs, Defence Contractor Organizations conducting military RPAS operations.

Costs and Benefits:

Clearer, and proportionate Regulation, Acceptable Means of Compliance and Guidance Material will reduce staffing burden on RC (eg removing the requirement for unnecessary applications for Waivers, Exemptions and Alternative Acceptable Means of Compliance). Proportionate regulation may deliver significant resource savings to both equipment procurement and support programmes.

Post Implementation Review:

Given the pace of change in the Regulatory Environment, the review does not aim to 'future proof' the new regulations against technological and other changes in the 2015+ timescale. That said, the 'normalisation' of regulation will provide a far more robust baseline from which to conduct any subsequent amendment that will inevitably be required in order to accommodate technological or other changes. Therefore, once issued under NAA, RPAS regulations will be reviewed every 6 months to ensure they keep pace with developments in the RC.

Consultation period ends: **26 Nov 14**

The consultation period for this proposed amendment ends on the stated date. Please send your feedback via email to MAA-MRPEnquiries@mod.uk.

MAA02: Military Aviation Authority Master Glossary

RPAS Extract for NPA

PURPOSE

1. This document is an extract of the relevant amendments to MAA02 for the RPAS NPA.

Term	Abbreviation	Definition
Aircraft Document Set	ADS	The documents that have a prime airworthiness function for each aircraft type. They include the Release To Service (RTS), ►Equipment Safety Assessment◄, Aircraft Maintenance Manual (AMM), Operating Data Manual(ODM), Flight Reference Cards (FRCs), Support Policy Statement, Engineering Air Publications (including the Flight Test Schedule (FTS)) and the Statement of Operating Intent and Usage(SOIU). The documents comprising the ADS may be held electronically.
►Beyond Visual Line of Sight	BVLOS	Operations of an RPA beyond a distance where the Remote Pilot is able to respond to or avoid other airspace users by visual means. (CAP 722)◄
Centre of Gravity	C of G or CG	►The point at which the weight of a body of mass (including a complete Aircraft with all items fitted) is assumed to act.◄. Normally, only the fore and aft (longitudinal) location of the centre of gravity is important for symmetrically loaded aircraft. If the lateral, or vertical position of the centre of gravity is likely to have any material effect, reference to it will be made in the Weight and Balance Data of the Air Publication concerned and, when applicable, on the Trim Sheet.
►Command and control link		The data link between the remotely-piloted aircraft and the remote pilot station for the purposes of managing the flight. (ICAO/CAP 722) ◄
Congested Area		►Any area in relation to a city, town or settlement which is substantially used for residential, industrial, commercial, or recreational purposes. (ANO 2009 Art 255)◄
►Detect and Avoid		The capability to see, sense or detect conflicting traffic or other hazards and take the appropriate action to comply with the applicable rules of flight. (ICAO) ◄
►Extended Visual Line of Sight	EVLOS	Operations either within or beyond the limits for VLOS whereby the Remote Pilot is able to comply with responsibilities for collision avoidance by employing other methods to address the requirement to maintain direct visual contact, such as the use of RPA Observers. (CAP 722)◄
►Ground Control Station	GCS	A facility or device from which the Remotely Piloted Air System is controlled, and/or monitored during all phases of flight. See: 'Remote Pilot Station'.◄
►Lost link (RPAS)		The loss of command and control link contact with the remotely-piloted aircraft such that the remote pilot can no longer manage the aircraft's flight. (ICAO/CAP722)◄

Term	Abbreviation	Definition
►Maximum Take Off Weight	MTOW	The maximum weight of the aircraft at which the pilot is permitted to attempt to make a take-off. Includes airframe weight, fuel and payload.◄
►Remote Pilot		The person who manipulates the flight controls of a remotely piloted aircraft during flight time. (ICAO)◄
►Remotely Piloted Aircraft	RPA	An aircraft that, whilst it does not carry a human operator, is flown remotely by a pilot, is normally recoverable, and can carry a lethal or nonlethal payload. (JDN 2/11) See 'Unmanned Aircraft'. ◄
►Remotely Piloted Air System	RPAS	A Remotely Piloted Air System is the sum of the components required to deliver the overall capability and includes the pilot, sensor operators (if applicable), Remotely Piloted Aircraft, Ground Control Station, associated manpower and support systems, satellite communication links and data links. (JDN 2/11) Note: It is recognised that the terms UAS and UA remain in common use to describe unmanned and remotely piloted aircraft; however the UK Defence preferred term RPAS best describes the fact that remotely piloted missions will always involve human operators and pilots.◄
Remotely Piloted Air System Commander	RPAS Cdr	RPAS Cdr is responsible for the conduct and safety of a specific flight and for supervising the person in direct control of the RPAS. His duties are equivalent to those of an Aircraft Commander.
►Remote Pilot Station	RPS	See: 'Ground Control Station'. (ICAO)◄
Remote Viewing Aid Equipment	RVA	Intentionally Blank
►Segregated Airspace		Segregated Airspace is a section of airspace with defined vertical and lateral limits reserved exclusively for specific users / operations during set periods to ensure the safety of all. These might include Danger and Restricted Areas, according to the nature of the activity taking place. Segregated airspace structures within the UK FIRs/UIRs are established to provide protection to other airspace users from activities that cannot be conducted in accordance with the normal Rules of the Air and could be hazardous to other aircraft engaged in normal flight. Such airspace structures, in keeping with the Flexible Use of Airspace (FUA) Commission Regulation 2150/2005, shall be of a temporary nature, applied only during limited periods of time and based on actual use. (CAA DAP)◄

Term	Abbreviation	Definition
►Sense and Avoid		See 'Detect and Avoid'◄
►Unmanned Aircraft	UA	An aircraft that does not carry a human operator, is operated remotely using varying levels of automated functions, is normally recoverable, and can carry a lethal or non-lethal payload. Note: In the UK, cruise and ballistic missiles are not considered to be unmanned aircraft (JDN 2/11) ◄
►Unmanned Air System	UAS	A system, whose components include the unmanned aircraft and all equipment, network and personnel necessary to control the unmanned aircraft. (JDN 2/11) Note: It is recognised that the terms UAS and UA remain in common use to describe unmanned and remotely piloted aircraft; however the UK Defence preferred term RPAS best describes the fact that remotely piloted missions will always involve human operators and pilots. ◄
►Visual Line of Sight	VLOS	A mode of operation in which the Remote Pilot maintains direct, unaided (accept for corrective lenses) visual contact with the aircraft to manage its flight and meet separation and collision avoidance responsibilities. Within the UK VLOS operations are normally limited to 400ft AGL and 500m from the Remote Pilot. (CAP 722) ◄

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MAA03: Military Aviation Authority Regulatory Processes

Annex F
RPAS Extract for NPA

ANNEX F: REMOTELY PILOTED AIR SYSTEMS CATEGORIZATION

Sponsor: Dep Hd Reg

Date of Last Review: 1 Oct 14

Date of Next Review: 1 Oct 15

Introduction

1. There is a requirement to categorize Remotely Piloted Air Systems (RPAS) so that an appropriate and proportionate regulatory regime can be determined and applied to ensure that an RPAS is safe to operate and is being operated safely. This Annex should be read in consultation with RA1600(2) RPAS Categorization.

Process

2. For those organizations seeking to procure an RPAS, early engagement with the MAA is encouraged. The case for categorization will ideally be made as early as possible in the procurement of the system to ensure that the correct regulatory regime is identified. For RPAS being procured through Defence Equipment and Support (DE&S) ideally this will be prior to Initial Gate, and certainly no later than Main Gate to ensure acquisition contracts are appropriately defined.

3. The case for categorization will be submitted by the head of the organization introducing the RPAS into the Military Air Environment (MAE) (typically the appropriate Operating Centre Director[1]) and must be endorsed, prior to submission to the MAA, by all key stakeholders: as a minimum the TAA, the Aviation DH/AM(MF) (where identified) and the Release to Service Authority (RTSA).

4. The case for endorsed categorization should be completed and sent to the MAA at MAA-MRPEnquiries@mod.uk. The case for categorization must cover the following material as a minimum iaw RA1600(2):

a. A technical description of the RPAS.

b. A description of the operating intent.

c. A statement of the aggravating and/or mitigating factors affecting the RPAS categorization (a list of typical factors is at RA1600 Remotely Piloted Air Systems, Table 2, Annex A).

d. The Airworthiness Strategy.

e. A statement of which MRP RAs are deemed to be applicable and the method of compliance.

f. A proposed Design Safety Target in accordance with (iaw) RA1600(11).

g. Detail of the key stakeholders ie RTSA, Aviation DH/AM(MF), DE&S PT, TAA, Front Line Commands (FLC).

[1] It is recognized that an ODH may not yet have been identified during the Concept Phase. It is also understood that an RPAS might be procured by individual FLC units and not via DE&S.

h. A statement that all documentation has been verified by the applicant.

5. Additional guidance material regarding content of the case for categorization is provided in RA1600(2) RPAS Categorization. It is in the best interests of the applicant to include as much available detail as possible to aid decision-making. Any enquiries regarding the categorization submission can be directed to the MAA at MAA-MRPEnquiries@mod.uk who will forward them to the relevant Desk Officer.

6. **Initial Action.** On receipt of the application for categorization the MAA MRP Enquiries Team will allocate an RPAS categorization reference number and will send an e-mail to the applicant confirming receipt and informing them of the unique reference number.

7. **Management of the RPAS Categorization Submission within the MAA.** The MAA will form a SQEP panel to review the categorization submission and a lead Desk Officer will be appointed to co-ordinate activity. The applicant may be invited to discussions to ensure full understanding of the specifics in the application. It is expected that from the time of receipt of all the required information to issuing a Letter of Endorsed Categorization back to the applicant will be no longer than 30 working days. If it is likely that the 30 day timescale will not be met, then the applicant will be informed and then regularly updated until the Letter of Endorsed Categorization is issued. A pictorial summary of the application process, required inputs, necessary stakeholders and outputs are outlined in Figure 1:

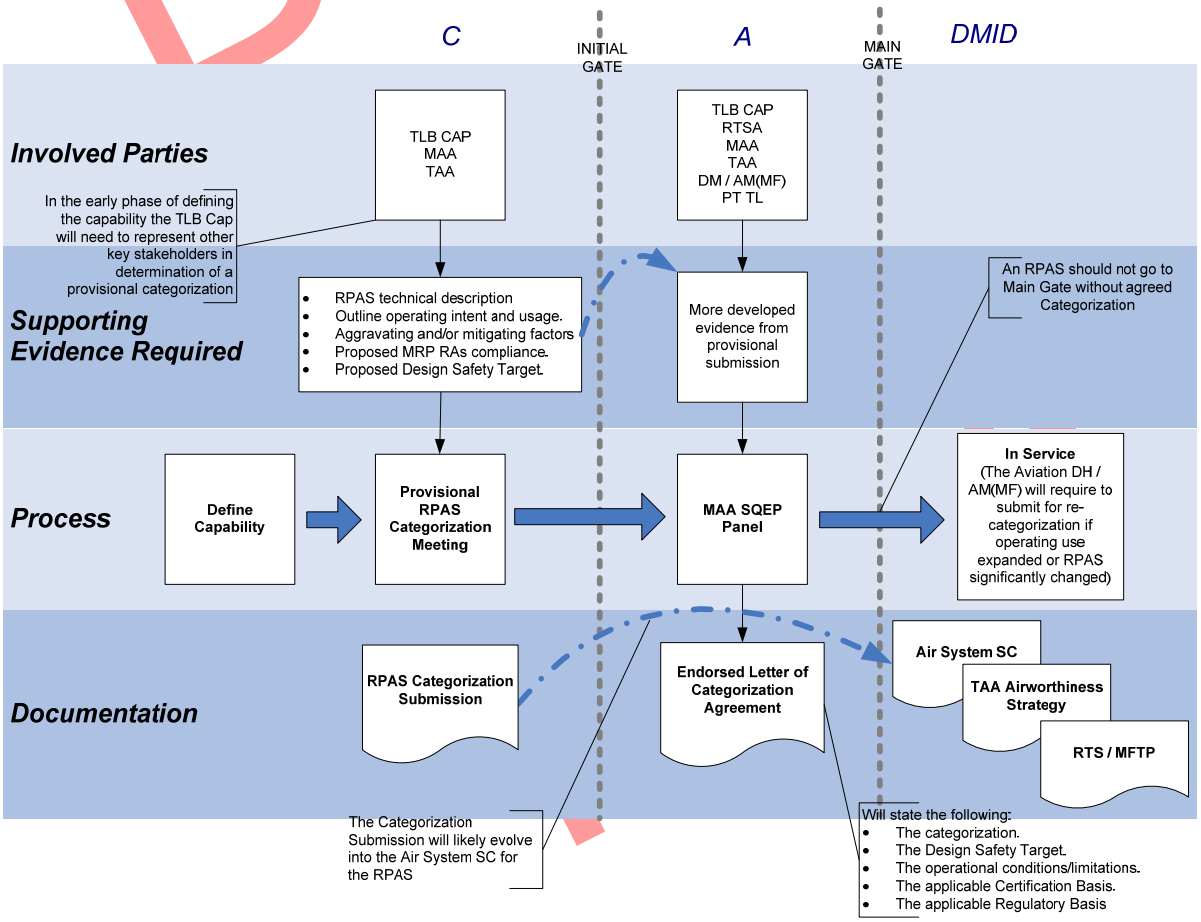


Figure 1 - Categorization Process, Inputs, Stakeholders and Outputs

8. **MAA Letter of Endorsed Categorization**. The categorization will be endorsed at the appropriate level in accordance with the MAA Authority Matrix. The MAA will provide a signed Letter of Endorsed Categorization to the applicant (copied to all key stakeholders) which will specify:

a. The RPAS Type.

b. The categorization.

c. The Design Safety Target (if applicable).

d. The operating conditions/limitations.

e. The applicable Type Certification Basis (if applicable).

f. The applicable Regulatory Baseline.

g. A unique identifying reference.

h. The title, name and signature of the MAA Endorsing Officer (iaw the MAA Authority Matrix).

9. **Validity of the Letter of Endorsed Categorization**. The Letter of Endorsed Categorization will remain valid for the life of the RPAS provided the conditions specified in the Letter of Endorsed Categorization remain valid. Changes to the equipment, operating use or environment of the RPAS, which fall outside the conditions specified in the Letter of Endorsed Categorization must be presented to the MAA for categorization reassessment.

10. **Changes to the Conditions Specified in the Letter of Endorsed Categorization**. Where an Aviation DH/AM(MF) wishes to expand the operating envelope beyond the conditions specified in the Letter of Endorsed Categorization, or where change to the equipment would result in a change to its air safety baseline[2], then they are required to resubmit a case for categorization outlining their proposal. It is important to note that this may result in a re-categorization of the RPAS which may, in turn, require additional MRP compliance (including certification). Therefore it is highly recommended that when a system is being procured, where there is a high likelihood of its operating envelope being subsequently expanded, then the first categorization submission will seek a categorization at an appropriately high level.

[2] For RPAS categorized as Class I(d), II or III which have been certified then such changes would fall into those considered to be Major Changes, iaw RA1500.

RA 1120 - Military Aircraft Registration

Rationale

The registration of military aircraft (as defined in MAA01) and their identification marking is required by international agreement to provide each aircraft with a unique identity. Head of Oversight and Approvals (Hd O&A) MAA issues the registrations of UK military aircraft and maintains a central register of all military aircraft on behalf of the Secretary of Sate.

Contents

Regulation 1120(1)

Military Aircraft Registration

1120(1) ►The Type Airworthiness Authority (TAA) **shall** ensure◄ all UK Military Aircraft are registered on the UK Military Aircraft Register (MAR).

Acceptable Means of Compliance 1120(1)

Military Aircraft Registration

Registration of UK Military Aircraft

1. All prospective UK military aircraft, ►including Remotely Piloted Aircraft (RPA) categorized as Class I(d), Class II or III[1],◄ **should** be registered under the authority of the post holder responsible for sponsoring the military use of the aircraft type. The prerequisites for military registration are that the aircraft **should** be:

   a. Capable of controlled flight.

   b. Intended to complete multiple flights.

   c. Required to operate in a manner outside that permitted by the Air Navigation Order (ANO), or the aircraft operation or design is outside Civil Aviation Authority (CAA) expertise.

   d. Owned by the Ministry Of Defence, or have a Certificate of Usage (CofU) as a Military Aircraft if owned by a civilian organization (see also RA 1123).

2. ►RPA[1] categorized as Class I(b) or I(c) will not be registered as individual airframes (this includes aerial targets used/employed within a defined weapons range[2]); instead the Type will be given a one-off Military Aircraft Registration Number. For these RPAs the Aviation Duty Holder/Accountable Manager (Military Flying) **should** maintain a record of individual aircraft identified by a unique serial number (identifying both the operator and the airframe); and **should** ensure that both the Type Military Aircraft Registration Number and the unique aircraft serial number are displayed on the main fuselage.

Note:

RPA categorized as I(a) do not require registration. ◄

3. For the military registration of civil-owned aircraft that will not be operated in the Service Environment, RA1121 **should** be used in addition to this RA.

[1] ►Categories of RPA are defined in RA1600 RPAS◄
[2] ►Note that this includes temporary ranges at sea, eg High Seas firing.◄

Guidance Material 1120(1)

Military Aircraft Registration

The Military Aircraft Register (MAR)

4. The registration of aircraft provides a unique identity that enables the following essential actions:

a. The certification of fitness for flight of individual airframes.

b. Identification in flight.

c. Configuration control.

d. A record of usage and maintenance.

5. The CAA registers all UK registered civil aircraft.

6. Procedures for registration include the requirement to issue Certificates of Registration and De-registration; these certificates provide the auditable record of aircraft being placed on, and removed from, the MAR.

Aircraft Registration

7. A flow chart outlining the requirements for military registration is attached at Annex A.

Allocation of Provisional Registration Numbers

8. Once the sponsor has confirmed that military registration of particular aircraft is required, the TAA may apply to Hd O&A MAA for allocation of provisional registration numbers. The application must be made in writing, giving the following information:

a. The aircraft type and mark.

b. The contract number.

c. The airframe and build number of each aircraft.

d. The estimated dates of first flight for each aircraft.

9. The Registrar will then provisionally enter the aircraft details onto the MAR and notify the TAA of the provisional numbers.

Registration

10. As soon as the TAA is able to advise a firm date for the first flight of each airframe, or for Military Registered Civil-Owned Aircraft (MRCOA) when the CofU has been signed, he will advise Hd O&A MAA who will authorize the Registrar to make the aircraft active on the MAR and issue a copy of the Certificate of Registration (see Annex B). Hd O&A MAA will retain the originals.

11. The TAA is responsible for reporting to Hd O&A MAA all events that affect the status of the aircraft on the Register.

De-registration

12. Where appropriate the Registrar will make the aircraft inactive on the MAR and issue a copy of the Certificate of De-registration to the TAA or the disposal agency as appropriate (see Annex C). Hd O&A MAA will retain the originals.

Transfer of Aircraft

13. When aircraft are transferred from the MAR to a civil or other nation's military register, Project Team Leaders must ensure that all UK military markings are removed.

Note:

Aircraft registration numbers are never removed from the MAR. De-registered aircraft are shown as inactive and have no authority to fly except in accordance with paragraphs 16-19 below.

►◄

14. ►◄

Guidance Material 1120(1)

15. ►◄

Civil Registered, Civil Owned Historic Military-Type Aircraft

16. Historic military type aircraft, that have been awarded a CAA Certificate of Airworthiness or a CAA Permit to Fly, may be granted permission, in the interests of aviation history, to display original, historically accurate military livery and 'applicable to type' military registration numbers in lieu of a civil registration number.

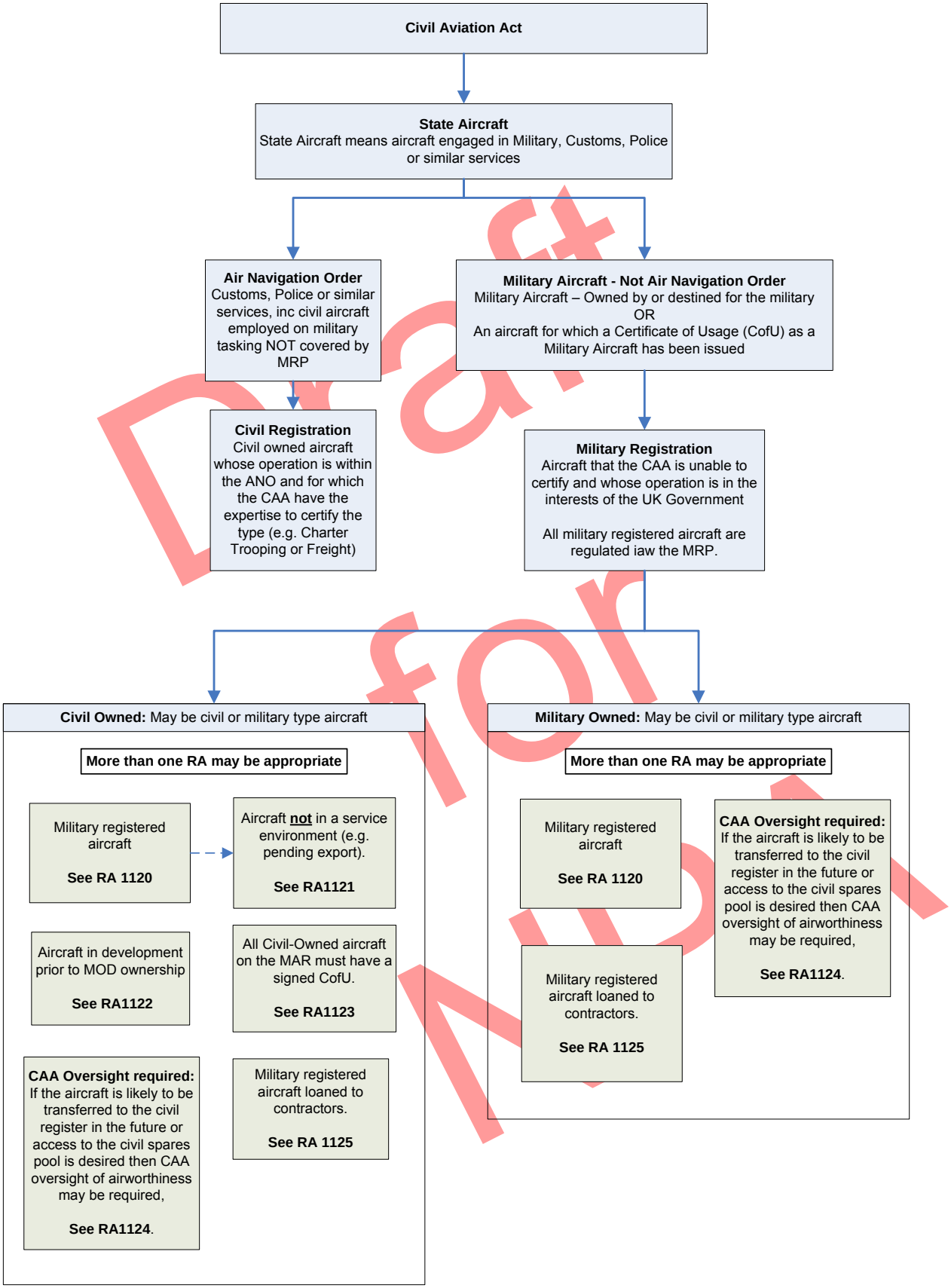
17. Applications to display historic military markings and liveries must be made to the appropriate Front Line Command (FLC) in accordance with the procedures detailed on the CAA web page entitled 'Exemptions from the need to display markings on UK Registered Aircraft'. The FLC will assess the application and its supporting documentation and, if satisfied, will forward the request to the Hd O&A MAA.

18. Providing the historic military registration number is not already in use it will be authorized. Hd O&A MAA will authorize the Registrar to annotate the MAR. The Registrar will maintain a separate section within the MAR to identify UK military registration numbers that have been authorized for display on civil-owned historic military type aircraft.

19. A letter of permission to operate with historic markings and liveries will be issued by the FLC to the applicant, copied to the Registrar. In order for the applicant to gain CAA exemption from Article 10 of the ANO they must send their letter of permission to the CAA Aircraft Registration Section in accordance with the guidance provided on the CAA web site.

ANNEX A

MILITARY AIRCRAFT REGISTRATION



ANNEX B

CERTIFICATE OF REGISTRATION

Military Aviation Authority

MAA

Certificate of Registration

This is to certify that the following aircraft

Type:

Mark:

Manufacturer:

Build Number:

Previous Registration Number (if applicable):

Has been allocated the Military Aircraft Registration Number:

and has been entered on the United Kingdom Military Aircraft Register

with effect from:

Date: *Time:*

MILITARY AIRCRAFT REGISTRAR
for MAA Date:

ANNEX C

CERTIFICATE OF DE-REGISTRATION

Military Aviation Authority

MAA

Certificate of De-Registration

This is to certify that the following aircraft

Type:

Mark:

Manufacturer:

Build Number:

which had the Military Aircraft Registration Number:

has been removed from the United Kingdom Military Aircraft Register with effect from:

Date: *Time:*

MILITARY AIRCRAFT REGISTRAR
for MAA Date:

RA 1600 - Remotely Piloted Air Systems (RPAS)

Rationale

There is a requirement to categorize RPAS so that an appropriate and proportionate regulatory regime can be determined and applied to ensure that an RPAS is safe to operate and is being operated safely.

Contents

Regulation 1600(1)

RPAS MRP Compliance

1600(1) The MRP **shall** apply to all RPAS in the Military Air Environment (MAE)[1]; where there is a difference between the regulation contained in this RA and the remainder of the MRP this RA **shall** take precedence.

Acceptable Means of Compliance 1600(1)

RPAS MRP Compliance

1. Nil.

Guidance Material 1600(1)

RPAS MRP Compliance

2. Nil.

Regulation 1600(2)

RPAS Categorization

1600(2) Any organization seeking to bring an RPAS into use in the MAE **shall** present a case to the MAA for its endorsed categorization[2] which will define the appropriate regulatory regime.

[1] The MAE is defined in MAA 02 as encompassing all organizations and activities related to the operation and support, both engineering and supply, of military-registered aircraft, including Military Registered Civil-Owned Aircraft (MRCOA), or airborne equipment by, or on behalf of, the MOD.

[2] From this point on the phrase 'categorized' in this RA refers to the MAA-endorsed category which defines how the RPAS will be regulated. RPAS Categories are listed at Table 1 of Annex A.

Acceptable Means of Compliance 1600(2)

RPAS Categorization

3. The case for categorization presented to the MAA **should** cover the following:

   a. A technical description of the RPAS.

   b. A statement of the operating intent.

   c. A statement of the aggravating and/or mitigating factors affecting the RPAS categorization (a list of typical factors is at Table 2 in Annex A).

   d. The Airworthiness Strategy.

   e. A statement of which MRP RAs are deemed to be applicable and the method of compliance.

   f. A proposed Design Safety Target, in accordance with (iaw) RA1600(11).

   g. Detail of the key stakeholders ie Release to Service Authority (RTSA).

   h. Aviation Duty Holder (DH)/Accountable Manager (Military Flying)(AM(MF)), Defence Equipment and Support (DE&S) Project Team, Type Airworthiness Authority (TAA), Front Line Commands (FLC).

   i. A statement that all documentation has been verified by the applicant.

4. The case for categorization **should** be endorsed by all key stakeholders (as a minimum the TAA, the Aviation DH/AM(MF) and the RTSA) prior to submission to the MAA.

5. When the RPAS categorization has been endorsed by the MAA, the case for categorization, together with the RAs that are applicable to the assigned category, **should** be used to create an Airworthiness Strategy that is proportionate and appropriate for that RPAS type, iaw RA1600(7).

6. Changes to the equipment, operating use or environment of the RPAS, which may change the categorization of the RPAS, **should** be re-presented to the MAA.

7. The case for categorization and the signed MAA Letter of Endorsed Categorization **should** be retained for the life of the RPAS Type plus 5 years.

Guidance Material 1600(2)

RPAS Categorization

8. There are a wide range of organizations seeking to introduce RPAS into the MAE, such as DE&S PTs, FLC units and trials organizations. Ultimately it will be the head of the organization which plans to introduce an RPAS into the MAE who will be responsible for submitting a case to the MAA for its categorization.

9. For those organizations seeking to procure an RPAS, early engagement with the MAA is encouraged. The case for categorization will ideally be made as early as possible in the procurement of the system to ensure that the correct regulatory regime is identified. For RPAS being procured through DE&S ideally this will be prior to Initial Gate[3], and certainly no later than Main Gate to ensure acquisition contracts are appropriately defined.

10. The application process, required inputs, necessary stakeholders and outputs are outlined in more detail at Annex F to MAA03.

11. The applicant will present a case to the MAA outlining a proposed categorization along with appropriate evidence to support their argument. The case for categorization needs to consider the characteristics of the RPAS in its operating context. This case must be submitted in coordination between all stakeholders; for example in the Service Environment there needs to be a discussion between RTSA, TAA, and Aviation DH to determine a case for categorization outlining their operating intent.

12. A non-prescriptive list of aggravating and mitigating factors is at Annex A. Given the vast array of RPAS brought into service, it would be unhelpful to be prescriptive on the exact content to be contained in the categorization submission.

[3] It is recognized that during the Concept phase it may not be clear that an RPAS can best meet the requirement.

Guidance Material 1600(2)

13. Annex B provides a list of recommended topics to be considered in the categorization submission. It is understood that the detailed content will be dependent on the specifics of the individual case. It is in the best interests of the applicant to include as much detail as is available to aid decision-making.

14. The MAA will consider each RPAS presented for categorization on a case by case basis. The NATO RPAS Maximum Take off Weight (MTOW) classification has been utilized as the start point for the MAA categorization schematic, as shown in Annex A. However the aggravating and mitigating factors regarding how and/or where the system will be operated are equally as significant in understanding the Risk to Life (RtL) that an RPAS poses.

15. The MAA will provide a signed Letter of Endorsed Categorization to the applicant which will state the categorization of the RPAS; the applicant is then responsible for ensuring compliance with the appropriate regulations in the MRP.

16. The Letter of Endorsed Categorization will remain valid for the life of the RPAS provided the conditions specified in the Letter of Endorsed Categorization remain extant.

17. Where an Aviation DH/AM(MF) wishes to expand the operating envelope beyond the conditions specified in the Letter of Endorsed Categorization, or where change to the equipment would result in a change to its air safety baseline[4], then they are required to resubmit a case for categorization outlining their proposal. It is important to note that this may result in a re-categorization of the RPAS which may, in turn, require additional MRP compliance (including certification). Therefore, it is highly recommended that when a system is being procured, where there is a high likelihood of its operating envelope being subsequently expanded, then the first categorization submission ought to seek a categorization at an appropriately high level.

18. This regulation does not apply to the use of RPAS by individuals or organizations which would be considered private, sport or recreational (ie non state use); such use is governed by the UK CAA iaw CAP 722 and CAP 393.

Regulation 1600(3)

Class I(a) RPAS

1600(3) With the exception of RA1600(2) and RA1600(3)[5] , RPAS categorized as Class I(a) are exempt from the other regulations in the MRP. However, the individual in charge of operating the Class I(a) RPAS shall be responsible for ensuring its safe operation.

Acceptable Means of Compliance 1600(3)

Class I(a) RPAS

19. Class I(a) RPAS **should not** be operated:

a. In any aerodrome traffic zone, except with the permission of either the appropriate ATC unit or the person in charge of the aerodrome.

b. In a manner that presents undue risk or hazard to any person, vessel, structure, vehicle or infrastructure.

Guidance Material 1600(3)

Class I(a) RPAS

20. Research has demonstrated that for a Remotely Piloted Aircraft (RPA) below 200g, ie Class I(a), the risk to 2nd or 3rd parties, either on the ground or consequent from Mid Air Collision, can be considered broadly acceptable in its own right without requirement for further mitigation beyond the AMC stated at RA1600(3) (ie the actual risk of death or serious injury from a collision is effectively independent of frequency of occurrence).

[4] For RPAS categorized as Class I(d), II or III which have been certified then such changes would fall into those considered to be Major Changes, iaw RA 1500.

[5] From this point on in this RA the phrase “All RPAS” will refer to “All RPAS, less those categorized as Class I(a).”

Regulation 1600(4)

RPAS Responsibilities

1600(4) All RPAS **shall** be operated under the authority of either an Aviation DH, iaw RA1020, or AM(MF), iaw RA1024, who is responsible for ensuring its safe operation.

The Aviation DH **shall** ensure that he is supported in the execution of his duties, for all RPAS within his area of responsibility (AoR), by a Senior Operator (SO), iaw RA1022, and Chief Air Engineer (CAE), iaw RA1023.

For all RPAS a TAA **shall** be responsible for the Type Airworthiness of the system throughout its life from development to disposal, iaw RA1015.

Acceptable Means of Compliance 1600(4)

RPAS Responsibilities

Aviation DH

21. The Aviation DH **should** follow AMC stated in RA1020, except that for RPAS categorized as Class I(b) the SQEP requirements of the Delivery DH (DDH) are that they:

a. **Should** be at least an OF4; such DHs must nevertheless be answerable to a designated Operating DH (ODH); and,

b. Need not have previous aviation unit command experience in order to fulfil the role provided their appointment is endorsed by the appropriate ODH.

AM(MF)

22. AM(MF)s **should** follow AMC stated in RA1024.

SO to Aviation DH

23. The SO **should** follow AMC stated in RA1022 for RPAS, except that for RPAS categorized as Class I(b) the SQEP requirements of the SO are that they:

a. **Should** be at least an OF2; such SOs must nevertheless be answerable to a designated DDH; and,

b. Do not require previous aviation experience but **should** have relevant supervisory experience provided their appointment is endorsed by the appropriate DDH.

CAE to Aviation DH

24. The CAE **should** follow AMC stated in RA1023, noting that for RPAS categorised as Class I(b), I(c) or I(d) they **should** meet the following criteria:

a. Be a professionally registered engineer, either:

(1) IEng level where he is supervised by a professionally registered CEng engineer; or,

(2) CEng level where he operates without supervision.

b. Have familiarity with the MRP 4000 series.

c. Specifically for RPAS categorized as Class I(c) or I(d) have previously held Engineering Authority level G.

TAA

25. The TAA **should** be appointed by the Operating Centre Director iaw AMC stated in RA1015(1), noting:

a. For RPAS categorized as Class I(b) or I(c) the TAA may be a B2/OF4.

b. For RPAS categorized as Class I(b) or I(c) the TAA is not required to contract with approved Design Organizations (DO) or with Approved Maintenance Organizations, iaw RA1005(1), but **should** ensure that these organizations have in place a recognized quality system, equivalent to ISO 9001.

Guidance Material 1600(4)

RPAS Responsibilities

TAA

26. With regard to the TAA's responsibilities for RPAS categorized as Class I(b) or I(c), where it is considered to be in the MOD's interest then DOs may be considered for inclusion under the Design Approved Organization Scheme (DAOS). In the absence of an appropriate DAOS approval then the TAA will document in an endorsed Airworthiness Strategy the arrangements made to ensure the competence of his DO.

Regulation 1600(5)

RPAS Airworthiness Strategy

1600(5) For all RPAS, the TAA **shall** produce an Airworthiness Strategy iaw RA1220.

Acceptable Means of Compliance 1600(5)

RPAS Airworthiness Strategy

27. The TAA **should** follow AMC stated in RA1220.

Guidance Material 1600(5)

RPAS Airworthiness Strategy

28. Further guidance on the preparation of an Airworthiness Strategy is provided in RA1220. Clearly, the content and level of detail of the Airworthiness Strategy will be proportionate to the characteristics and complexity of the particular system ie an RPAS categorized as Class I(b) will not require the same level of detail as an RPAS categorized as Class III.

Regulation 1600(6)

RPAS Air System SC

1600(6) For each RPAS Type the appropriate Aviation DH or AM(MF) **shall** own and manage an Air System SC which provides an evidenced and coherent argument that the system is safe to be operated and is being operated safely.

Acceptable Means of Compliance 1600(6)

RPAS Air System SC

29. For RPAS categorized as Class I(d), II or III the ODH/AM(MF) **should** demonstrate that the Air System is safe to operate and is being operated safely through an Air System SC meeting the AMC stated in RA1205.

30. For RPAS categorized as either Class I(b) or I(c) the ODH may delegate responsibility for the Air System SC to the DDH, but such a delegation **should** be documented. Where the ODH has delegated responsibility for the Air System SC to the DDH, then the DDH **should** follow the responsibilities defined for the ODH stated in AMC to RA1205.

Guidance Material 1600(6)

RPAS Air System SC

31. RPAS, by their very definition, do not pose a first party risk in their operation; consequently it is necessary to define the system's use in order to understand the RtL that it poses. The Air System SC, as the document that draws together the pan-Defence Lines of Development (DLOD) parameters, has been identified as the key document to provide that requisite level of understanding.

32. The use of an Air System SC is defined in RA1205; however, it must be noted that this RA currently only defines this as a requirement for the ODH. For RPAS this RA mandates the Air System SC as a universal requirement for all RPAS operations

Guidance Material 1600(6)

including those conducted under the Contractor Flying Approved Organization Scheme (CFAOS) with an AM(MF). The Aviation DH/AM(MF) must make a formal declaration that RtL posed by the RPAS are at least Tolerable and ALARP.

33. Further GM regarding preparation of the Air System SC is provided in RA1205. Clearly, the content/detail of the Air System SC will be dependent on the particular system ie an RPAS categorized as Class I(b) will not require the same content or detail as an RPAS categorized as Class III. Aviation DH may use Annex B as a useful checklist when completing their Air System SC. It is recognized that much of this content may exist within the RPAS Release to Service (RTS).

Regulation 1600(7)

RPAS Clearances

1600(7) For all RPAS the Aviation DH or AM(MF) **shall** ensure that the RPA is operated iaw:

a. An RTS, iaw RA1300; or,

b. A Military Flight Test Permit (MFTP), iaw RA5202; or a Certificate of Usage (CofU), iaw RA1121.

Acceptable Means of Compliance 1600(7)

RPAS Clearances

34. The RTS **should** be approved following AMC stated in RA1300.

35. For RPAS undergoing trials and development flying an MFTP **should** be approved iaw AMC stated in RA5202.

36. For RPAS which are MRCOA a CofU **should** be approved iaw AMC stated in RA1121.

Guidance Material 1600(7)

RPAS Clearances

37. Where an RPAS has been purchased as a Commercial Off The Shelf (COTS) product, or where there is another reason why there is limited evidence (eg software of unknown provenance), or where there is a lack of a formal Military Type Certification for RPAS categorized as Class I(b) or I(c), then there may well be a case to authorize an RTS or MFTP based on limited evidence.

38. The content/detail of the RTS/MFTP will be dependent on the particular system; ie an RPAS categorized as Class I(b) will not require the same level of detail or evidence as an RPAS categorized as Class III.

39. Further GM related to RPAS RTS is contained in RA1300.

Regulation 1600(8)

RPAS Occurrence Reporting

1600(8) For all RPAS the Aviation DH or AM(MF) **shall** ensure that all Air Safety reportable occurrences are reported iaw RA1410.

Acceptable Means of Compliance 1600(8)

RPAS Occurrence Reporting

40. All RPAS occurrences **should** be reported, investigated and recorded iaw with AMC stated in RA1410. For RPAS categorized as Class I(b) or I(c) the Aviation DH/AM(MF) may waive the requirement for an Occurrence Safety Investigation (OSI) down to a Local Occurrence Investigation (LOI) for an accident where the means of loss is consistent with the operating use of the system; this process **should** be detailed in orders or the organization's Operations Manual.

Guidance Material 1600(8)

RPAS Occurrence Reporting

41. Examples of when it would be appropriate for the DDH to waive a full OSI for a Category 5 Accident might include: where an RPAS target is deliberately shot down over a controlled range, or where an RPAS's loss was consistent with its intended concept of use. Ultimately it is for the DDH to decide that there is nothing to be gained from a formal OSI. As a minimum the subsequent LOI still requires codification by the Incident Manager prior to being closed down.

Regulation 1600(9)

RPAS Certification

1600(9) The TAA shall ensure that:

a. RPAS categorized as Class I(d), II or III shall be certified iaw RA1500(1).

b. RPAS categorized as Class I(d), II or III shall be designed to agreed safety targets iaw RA1230(1).

c. For RPAS categorized as Class I(b) or I(c), where formal certification is not required, an evaluation process in line with the intent of RA1500(1) is carried out and documented in an Equipment Safety Assessment iaw RA1220(2).

Acceptable Means of Compliance 1600(9)

RPAS Certification

42. For RPAS categorized as Class I(b) or I(c), which are not required to meet Design Safety Targets, the TAA **should** generate an Equipment Safety Assessment iaw RA1220.

43. RPAS categorized as Class I(d) **should** use a Design Safety Target based on STANAG 4746 (light rotary wing RPAS) or STANAG 4703 (light fixed wing RPAS).

44. RPAS categorized as Class II or III **should** use a Design Safety Target established in STANAG 4671 or STANAG 4702 as referred to in Def Stan 00-970 Part 9.

Guidance Material 1600(9)

RPAS Certification

45. For RPAS categorized as Class I(b) or I(c) the TAA will provide assurance of the Equipment DLOD of the initial RTS Recommendation iaw RA1013(1) and RA1500(1) prior to RTS as an alternative to formal certification.

46. As stated in AMC, Design Safety Targets for Class I(d), II or III RPAS are based on STANAG requirements. The selection of the appropriate STANAG is based on the MAA-endorsed categorization and not exclusively the "weight" boundaries within the STANAGs. Therefore, it is possible that an MAA-endorsed RPAS categorization may fall into a different STANAG "weight" category.

47. Where an RPA falls above the quoted STANAG weight limits, the Design Safety Target associated with the upper boundary applies. Eg a fixed wing RPA categorized, and regulated, as Class I(d), but with a weight greater than 150 kg, would reference the Design Safety Target in STANAG 4703 for 150 kg RPA. Equally, where an RPA falls below the quoted STANAG weight limits, the Design Safety Target associated with the lower boundary applies.

Regulation 1600(10)

RPAS Operation

1600(10) The Aviation DH or AM(MF) **shall** ensure that RPAS within their AoR are operated in a manner that minimizes the risk and hazards to ground crew, other airspace users or the general public over which such RPA are flown iaw RA2320.

Acceptable Means of Compliance 1600(10)

RPAS Operation

48. Aviation DH and AM(MF) **should** follow AMC stated in RA2320.

Guidance Material 1600(10)

RPAS Operation

49. Nil.

Regulation 1600(11)

RPAS Continuing Airworthiness

1600(11) The Aviation DH/AM(MF) **shall** ensure that RPAS within their AoR are maintained iaw RA4050.

Acceptable Means of Compliance 1600(11)

RPAS Continuing Airworthiness

50. AMC stated in RA4050 **should** be followed.

Guidance Material 1600(11)

RPAS Continuing Airworthiness

51. Nil.

ANNEX A

MAA RPAS Categorization Proces

1. The categorization of an RPAS will be an important step in the procurement, operation and management of the system which will define its regulatory regime. The categorization system permits a proportional regulatory regime across the entire spectrum of RPAS. The NATO Classification, based on MTOW, has been utilized as the baseline for Categorization (see Table 1). While MTOW is used as the initial determinant of RPAS categorization, the intended use and operation of the RPAS is potentially a more significant factor in understanding the 2nd and 3rd party RtL that it poses. MTOW will not be considered the sole determinant of the final categorization of an RPAS but must also be considered alongside the aggravating and mitigating factors of its operation and characteristics. The MAA regulatory categories for RPAS are shown diagrammatically in Figure 1.

Table 1 - NATO Class and Common Taxonomy

MTOW	NATO Class	Common Taxonomy	Starting MAA Category
< 200g	Class 1 < 150 kg	NANO	Class I(a)
200g to 2kg		MICRO <2kg	Class I(b)
2kg-20kg		MINI 2-20 kg	Class I(c)
20kg-150kg		SMALL >20 kg	Class I(d)
> 150kg	Class II 150 - 600kg	TACTICAL <150 kg	Class II
> 600kg	Class III > 600kg	MALE / HALE / Strike	Class III

2. There are a wide range of factors that could be considered to be aggravating or mitigating to the risk posed by a particular RPAS to 2nd and 3rd parties. A non-exhaustive list of such factors is provided in Table 2.

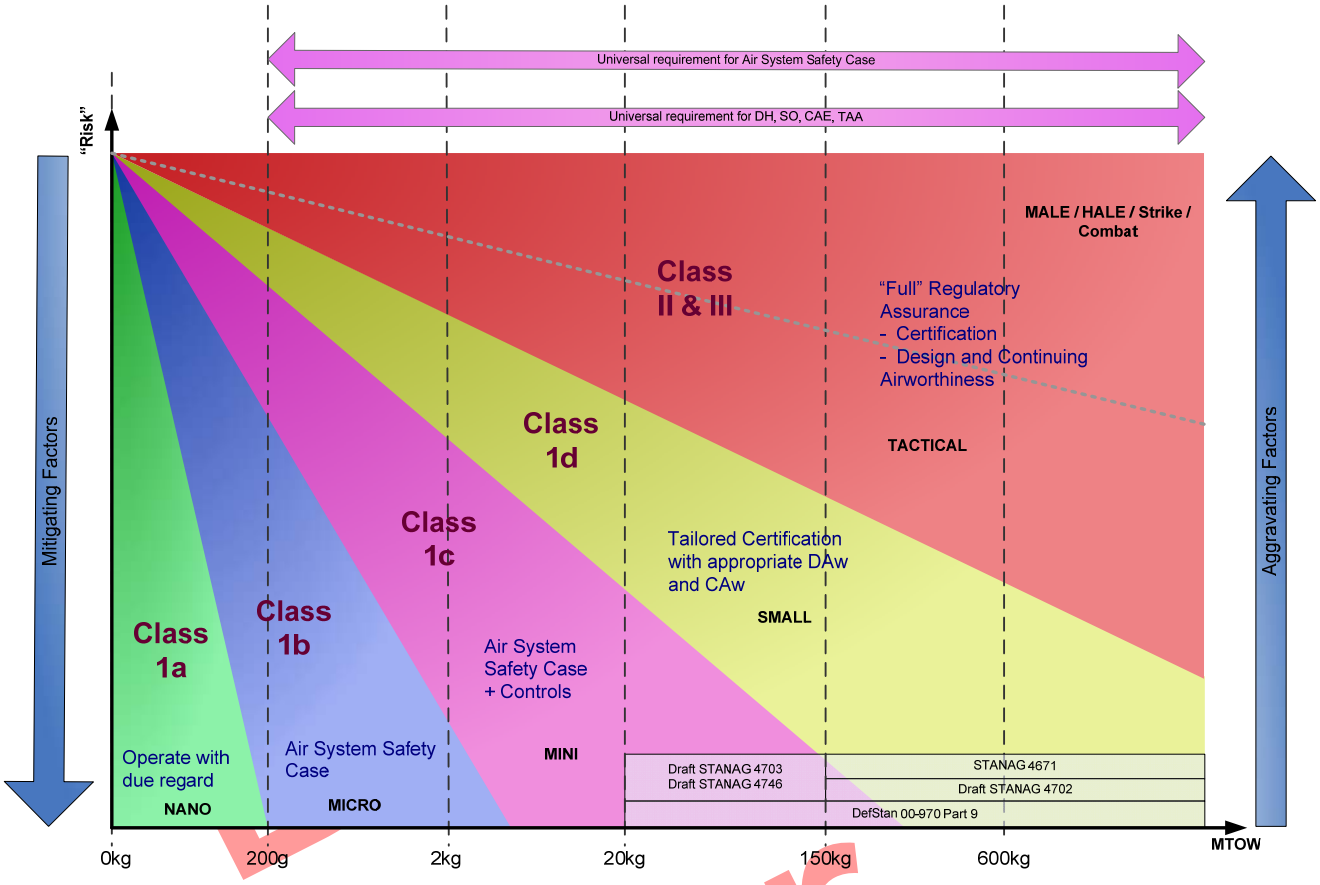
Table 2 - Categorization Aggravating and Mitigating Factors[6]

Mitigating Factors	Aggravating Factors
• Operation in Visual Line of Sight (VLOS) • Operation in Segregated Airspace • Over flight of low population density • Flight termination system • Redundancy • Frangibility of RPAS structure	• Extended range operation Beyond VLOS (BVLOS) • Operation in non-Segregated Airspace • Over flight of congested areas / high population density • Weaponisation • Failure mode - high Kinetic Energy • Complexity

3. The organization seeking to bring the RPAS into the MAE needs to consider the characteristics of the system; the intended operation with specific understanding of where that might take place and the corresponding exposure of 2nd and 3rd parties in that environment; and the method of operation such in that it controls the RPA within the intended area of operation.

[6] NB: This highlights a number of expected factors; however, it is non-exhaustive. Applicants must consider all potential aggravating and mitigating factors specific to the RPAS being categorized.

Figure 1 - MAA Regulatory Categories Illustration



ANNEX B

Safety Checklist

This Safety Checklist provides recommended headings and content to be included in the Categorization Submission. However, it is recognized that some of the content detailed below may not be available at the time the categorization submission is prepared. It is in the best interests of the applicant to include as much information as available to inform the decision on Endorsed Categorization. This checklist is equally applicable when constructing an Air System SC and is especially constructed to assist Aviation DH developing Air System SC for RPAS in the I(b) and I(c) categories. It is recognized that much of the content will be covered by documents such as the RTS etc.

1. Organization

{Full details of the organization that is subject to the application – all areas detailed below ought to be covered as a minimum. Where examples are given they do not outline the full requirement}

1.1 Structure of organization and management
{Brief description}

1.2 Key personnel
{As appropriate, eg TAA, DDH, AM(MF), CAE etc.}

1.3 Responsibility and duties of the RPAS Commander
{MRP 2000 series will provide guidance}

1.4 Responsibility and duties of support personnel in the operation of the RPAS
{Operators may use an assistant to help with the operation of the RPA. Give a brief description of this person's responsibilities and duties}

1.5 Type of operation
{Detail nature of operation e.g. VLOS, flexible/dynamic tasking, day/night, weather etc}

1.6 Supervision of RPAS operations
{A description of any system that may exist to supervise the operations of the operator}

1.7 Flight team composition
{Composition of the flight team according to nature of operation, complexity, type of RPA etc.}

1.8 Operation of multiple types of RPAS
{Detail any limitations to the numbers and types of RPAS that a pilot may operate if appropriate}

1.9 Qualification requirements
{Details of any qualifications, experience or training necessary for the pilot or support crew according to the types of RPAS and roles employed by the operator}

1.10 Crew health
{A statement and any guidance to ensure that the crew are appropriately fit before conducting any operations}

1.11 Logs and records
{Requirements for logs and records of flights for the RPAS and by the pilots}

1.12 Details of the operator training programme
{Training and checking requirements for pilots and support crew as determined by the operator to cover initial, refresher and conversion syllabi. Include any independent assessment of pilot competency and currency requirements}

1.13 Accident prevention and Flight Safety programme
{Include any reporting requirements and interface with Safety Management System}

1.14 Other documents
{As considered necessary – copies of any documents ought to be attached}

2. Systems

{Technical descriptions and details of the Air System that is subject to the application – all areas detailed below ought to be covered as a minimum._Where examples are given they do not outline the full requirement}

2.1 Details of design organization and manufacturer/production organization
{The designer and manufacturer may be the same company}

2.2 Recognized standards to which the equipment has been designed, built and tested if applicable
{Details of any standards that may or may not be aviation related and may add to the safety argument. Where known this ought to include test and evaluation evidence}

2.3 The designed flight envelope
{Full description of the flight envelope including: MTOW, duration, communications range, max height and speeds to maintain safe flight and glide profile (where appropriate). Include effects on flight envelope of differing payloads}

2.4 RPA dimensions
{Full dimensions to be given including mass with and without fuel; with and without any payloads etc.}

2.5 Design features
{Detail the design features of the system, materials used, type of structure, software assurance etc.}

2.6 Construction
{Detail the build nature of each air system}

2.7 Electrical power and distribution
{Detail the electrical power and distribution, include battery type and number, generator specifications, equipment ratings, load shedding where appropriate etc.}

2.8 Propulsion system
{Detail the propulsion system(s) used, power output, type of propeller/rotor etc.}

2.9 Fuel System
{Detail the fuel system arrangement, type of fuel, fuel delivery etc.}

2.10 FMS and Flight Control System
{Detail of how the RPA is controlled, control linkages, control rigging, include any automatic stabilisation etc.}

2.11 Navigation and Guidance
{Detail the system used for navigation and guidance, include any automatic piloting, telemetry etc.}

2.12 Other avionics
{Detail any other avionics fitted to the system}

2.13 Launch and Recovery
{Describe the launch and recovery systems and detail any landing aids fitted to the system}

2.14 Payloads
{For each RPA give a technical description of the payload expected to be installed or carried}

2.15 Emergency recovery or safety systems
{Detail any systems fitted to the RPA or Ground Control Station (GCS) that contribute to safe flight or handling including their modes of operation e.g. ballistic parachutes, propeller guards, independent flight termination, flight recovery system etc.}

2.16 Modifications to the system
{Detail any modifications that have been made post initial design}

2.17 GCS
{Where a laptop is utilised give details of the type of operating system and other technical specifications. Give detail of process for firmware and software updates}

2.18 C2
{Describe the C2 infrastructure, how its integrity is monitored and the reaction of the system to degraded signal strengths. Outline the RF plan for the intended operating area}

2.19 C2 Loss Prevention
{What design characteristics or procedures are in place to prevent and mitigate loss of link whether due to RF interference, equipment malfunctions (RPA/GCS) or atmospheric conditions}

2.20 Lost Link
{Describe the RPA lost link logic, profile and management for all phases of flight}

2.21 Whole system single points of failure (SPOF)
{For each element of the whole system, identify where SPOF may exist}

2.22 Change Management (modifications)
{Detail how the organization manages changes to the original design}

2.23 Lifing, maintenance schedules and inspections
{Describe the general maintenance philosophy for the platform}

2.24 Repair and servicing
{Where repairs to the system are necessary describe the repair and servicing philosophy}

2.25 Known failure modes
{For the whole system identify known failure modes and detail preventative strategy}

2.26 Failsafe features
{Detail any failsafe features in the design of the system}

2.27 Operating limitations and conditions (for categorization phase only)
{List the minimum and maximum operating conditions that would usually be detailed in the RTS to highlight any mitigating or aggravating factors}

2.28 Transportation requirements
{Detail how the system is transported between sites. Include all carry cases, transport description etc.}

3. Operations

{Details of the operating environment and procedures subject to the application – all areas detailed below ought to be covered as a minimum. Where examples are given they do not outline the full requirement}

3.1 Area of operation
{Full detail of expected areas of geographic operations including operating areas eg congested areas, open countryside, roads etc. Consideration of over flown population density, suitability of launch and recovery locations and required services}

3.2 Operating limitations and conditions
{Minimum and maximum operating conditions and limitations; reference RTS if available}

3.3 Supervision of RPAS operations
{A description of any system to supervise the operations of the operator}

3.4 Operating site planning and assessment
{Airspace operating environment considerations and procedures e.g. controlled or restricted airspace, local avoids and hazards}

3.5 Communications

{Awareness and links with other users and aircraft operators}

3.6 Weather
{Consideration of RPAS environmental limitations}

3.7 On site procedures

a. Site Survey *{Methods of surveying operating area, identifying hazards and any risk assessment}*
b. Selection of operating area and alternate *{Methods of identifying and selecting operating area and how the alternate would be kept clear}*
c. Crew briefing *{Procedures to brief crew e.g. task, responsibilities, duties, emergencies etc.}*
d. Cordon Procedure *{Adherence of separation criteria}*
e. Communications *{Procedures to maintain contact with crew and adjacent air operations if appropriate}*
f. Weather Checks *{Met brief provision, limitations and operating considerations}*
g. Refuelling *{To include changing / charging of batteries}*
h. Loading of equipment *{Detail procedures taken to ensure security of loaded equipment}*

3.8 Assembly and functional checks
{Checks conducted on completion of assembly of the system}

3.9 Pre-flight checks
{Checks conducted immediately prior to flight}

3.10 Flight Procedures
{Start, take-off, in-flight, landing, shutdown}

3.11 Post-flight or between flight checks
{Detail the checks or inspections conducted both after flight and between flights}

3.12 Emergency Procedures
{Include lost link, flyaway, fire (RPA and GCS), etc. Preventative measures ought to also be detailed}

3.13 Surveillance of Operations
{Surveillance methods for verification of RPAS geospatial positioning}

RA 2130 - Safety Equipment, Survival Drills and Training

Rationale

Aircrew operating UK Military Aircraft need to have a thorough working knowledge of all safety equipment and survival drills appropriate to their aircraft type and role.

Contents

Regulation 2130(1)

Safety and Survival Training

2130(1) On conversion to a new aircraft type all aircrew **shall** complete the appropriate safety and survival drill training mandated by Aviation Duty Holders or Accountable Managers (Military Flying) (AM(MF)).

Acceptable Means of Compliance 2130(1)

Safety and Survival Training

1. Aviation Duty Holder and AM(MF) Orders covering safety and survival drills **should** include, where necessary, the following:

a. The category into which each unit within their area of responsibility (AoR) falls for the periodicity of drills table at Annex A.

b. Any additional requirement or change in periodicity to that indicated at Annex A.

c. The procedures to be followed when a dispensation or extension is deemed necessary.

d. The safety and survival drill requirements for supernumerary crew, and, where appropriate, passengers.

e. The qualifications to be held by personnel delivering safety and survival training.

Guidance Material 2130(1)

Safety and Survival Training

2. **Abandon Aircraft Drill on the Ground**. The abandon aircraft drill will be practised wearing maximum bulk AEA and SE from the strapped in position.

3. **Ejection Drill and Manual Separation Drill**. Ejection drills will include a comprehensive review of the seat components, its operation, limitations and ejection sequence. Drills must include the strapping in procedure and safety implications of not strapping in correctly. Practical drills in the use of each firing handle, if appropriate, and seat failures will be conducted with personnel wearing their complete AEA and the seat in the normal flying position.

4. **Wet drills.** When wet drills are conducted, it is deemed that the equivalent dry drill has been completed. Similarly when a sea drill is completed this will replace the requirement for the associated pool drill.

5. **Dry Liferaft and Life Preserver Drills**. Dry liferaft and life preserver drills will include a lecture and appropriate demonstrations covering all aspects of personal SE

Guidance Material 2130(1)

carried and give instruction in helicopter rescue techniques.

6. **Synthetic Parachute Training**. Synthetic parachute training will be conducted wearing the appropriate full AEA and SE and is to include parachute flight drills, associated emergencies, parachute landings in all directions and assisted falls. A briefing that covers ground dragging and harness release will also be given. In addition, water parachute dragging drills will be practised in conjunction with wet liferaft drills.

7. **Wet Multi-Seat Liferaft Drill**. Multi-seat liferaft drills include a requirement for aircrew whose aircraft do not normally carry multi seat liferaft. They are conducted to familiarize aircrew with the type of liferaft that may be supplied to them by rescue crews, or in which they may have to survive when flying as a passenger in a transport aircraft. However, some dispensations are given in the periodicity chart promulgated at Annex A.

8. **Underwater Escape Training (UET)**. UET training is required for all helicopter aircrew in accordance with Annex A. Aviation Duty Holders and AM(MF) must consider the UET requirements for supernumerary crew and passengers who fly regularly in helicopters over the sea. It will normally be carried out in a suitable rotary-wing module at the UET Unit (UETU), RNAS Yeovilton (AIR Course 319) although alternative facilities may be used for detached units or Defence Contractor Flying Organizations.

9. **Short Term Air Supply System (STASS) Dry Drill**. Initial STASS dry drills will be completed at the UETU. Subsequent STASS dry drills will be completed in accordance with Annex A, and may be carried out locally.

10. **STASS Wet Drill**. STASS wet drills will be completed by eligible personnel at the same time as UET. All personnel required to undertake wet STASS training will be medically screened prior to the training, using the Medical Screening Questionnaire at Annex D.

11. Aviation Duty Holders and AM(MF) may permit personnel who are medically boarded and assessed as permanently unfit for wet STASS training, but who have previously completed wet STASS training, to conduct dry STASS drills only. This judgement will be made with medical guidance on a case by case basis and must be recorded in the individual's Flying Log Book.

12. **Safety Boat**. Whenever safety and survival training is carried out at sea or in open water, a safety boat will always be in attendance. In the case of aircraft carriers and other ships carrying more than one helicopter, the safety boat may be replaced by a helicopter in the SAR role at immediate readiness on the deck or airborne and able to reach the exercise area within three minutes flying time.

13. **Combat Survival Training**. Aviation Duty Holders and AM(MF) will issue Orders detailing the requirements for and periodicity of combat survival training.

14. **Specific Exemptions.** Those aircrew and trainees not required to conduct over water training sorties may be exempted from the liferaft/preserver drills, wet winching drills and UET/STASS drills as detailed in Aviation Duty Holder or AM(MF) Orders. This exemption will be formalized in writing.

Regulation 2130(2)

Safety and Survival Training Currency

2130(2) All aircrew required to fly as crew **shall** be current for all safety and survival drills, including those required for embarked operations, appropriate to aircraft type and role.

Acceptable Means of Compliance 2130(2)

Safety and Survival Training Currency

15. Unless an extension or dispensation has been granted, the maximum periodicity of drills **should not** exceed those promulgated in Annex A.

Guidance Material 2130(2)

Safety and Survival Training Currency

16. Aviation Duty Holders and AM(MF) may grant extensions to the periodicity indicated at Annex A for operational reasons, or in exceptional circumstances. Exceptionally, after an appropriate risk assessment, Aviation Duty Holders and AM(MF) may exempt crews from maintaining currency in a specific drill when they consider that it is not applicable to an aircraft type and/or role.

Regulation 2130(3)

Wearing and Carriage of Aircrew Equipment Assemblies (AEA) and Safety Equipment (SE)

2130(3) Aviation Duty Holders and AM(MF) **shall** issue detailed orders covering the wearing and carriage of approved AEA and SE by aircrew, supernumerary crew and passengers in all aircraft under their AoR.

Acceptable Means of Compliance 2130(3)

Wearing and Carriage of Aircrew Equipment Assemblies (AEA) and Safety Equipment (SE)

17. For aircraft with a Release To Service (RTS), only AEA and SE approved in the Aircraft Document Set (ADS) **should** be worn or carried.

18. For non-RTS aircraft, Aviation Duty Holders and AM(MF) Orders and/or Defence Contractor Flying Organizations' Clearances **should** detail the AEA and SE to be worn and carried.

19. **Modification of Equipment.** AEA and SE **should not** be modified in any way without approval of the relevant equipment authority. Where no equipment authority exists, approval **should** rest with the Aviation Duty Holder or AM(MF).

Guidance Material 2130(3)

Wearing and Carriage of Aircrew Equipment Assemblies (AEA) and Safety Equipment (SE)

20. Nil.

Regulation 2130(4)

Safety Harnesses

2130(4) All aircraft occupants **shall** be suitably restrained in all phases of flight.

Acceptable Means of Compliance 2130(4)

Safety Harnesses

21. Unless specifically authorized by the aircraft commander, Aircrew and Supernumerary Crew **should** wear the appropriate restraint harness, secured to a suitable anchorage point, at all times, except when attached to a winch cable or, when required to move about within the cabin (eg. Air Stewards). Aircraft Commanders **should** only allow crew safety harnesses to be unfastened in flight when necessary to complete authorized tasks. However, the pilot controlling the aircraft **should** be securely strapped into his seat at all times.

22. For take-off and landing, Aircrew and Supernumerary Crew **should** be seated and restrained using a seat harness. Specific circumstances where seat-harness restraint for take-off and landing is not appropriate **should** be detailed in Aviation Duty Holder or AM(MF) Orders.

23. Passengers and troops **should** be strapped in at all times when the aircraft is moving except under the provisions of RA2340.

Guidance Material 2130(4)

Safety Harnesses

24. Orders must specify the occasions and safety procedures where discrete activities require an ejection seat occupant to 'unstrap'.

25. Dispatcher harnesses, whilst preventing the wearer from inadvertent exit from the aircraft, do not provide the same degree of restraint or protection as seat harnesses. The time spent solely restrained in a dispatcher harness or attached to a winch cable must be kept to a minimum consistent with the safe completion of the task.

Regulation 2130(5)

Survival and Rescue Equipment

2130(5) Survival and rescue equipment of the appropriate type and scale **shall** be carried for all occupants.

Acceptable Means of Compliance 2130(5)

Survival and Rescue Equipment

26. **Liferafts**. Liferafts in sufficient numbers, and of sufficient capacity to accommodate all the occupants of the aircraft, **should** be carried where a forced landing over land cannot be achieved. Aviation Duty Holders and AM(MF) may empower authorizing officers to waive this requirement where operational considerations render the carriage of liferafts impractical or when they are satisfied that all reasonable steps have been taken to ensure that rescue can be accomplished within predicted survival times.

27. **Medical Supplies**. Medical supplies and/or first aid kits appropriate to the aircraft role and number of occupants **should** be carried.

28. **Survival Packs**. Aviation Duty Holders and AM(MF) **should** specify when and what type of survival packs **should** be carried onboard the aircraft.

Guidance Material 2130(5)

Survival and Rescue Equipment

29. Nil.

Regulation 2130(6)

Ejection Seat Anthropometrics

2130(6) All personnel for whom ejection seats are provided **shall** be checked for size and weight to ensure that they fit within the seat parameters.

Acceptable Means of Compliance 2130(6)

Ejection Seat Anthropometrics

30. An Ejection Seat check **should** be conducted by an Authorized Medical Examiner (AME) or qualified crew member prior to the first flight on type and when wearing appropriate maximum and minimum bulk AEA and SE to ensure that there is adequate clearance between the seat occupant and the aircraft structure.

31. **Ejection Seat Boarding Weight Limits**. Aviation Duty Holders and AM(MF) **should** ensure that the minimum and maximum boarding weight limits for the ejection seats of each appropriate aircraft type under their command are established and displayed in appropriate areas alongside weighing machines. Aircrew **should** ensure that they remain within the promulgated limits.

Guidance Material 2130(6)

Ejection Seat Anthropometrics

32. **Ejection Seat Check.** Ejection seat checks for ad-hoc occupants need not be conducted wearing maximum and minimum bulk, but must be conducted with the AEA and SE appropriate for the sortie to be flown.

ANNEX A

PERIODICITY OF SAFETY AND SURVIVAL DRILLS

	F/W A/C with Ejection Seats		F/W A/C with Parachutes		F/W A/C without Parachutes		Helicopters		►RPAS(9)◄
	Maritime Role (1)	Other	Overland Flight Only	Other	Maritime Role (1)	Other	Maritime Role (1)	Other	-
Dry Training									
Abandonment aircraft	6m	6m	6m	6m	6m	6m	6m	6m	►6m◄
Ejection and manual separation	9m	9m	-	-	-	-	-	-	-
Bale out (static seat)	-	-	6m	6m	-	-	6m (8)	6m (8)	-
Dry liferaft (primary) and preserver drill	6m	6m	-	6m	6m	1yr	6m	1yr	-
Dry multi seat liferaft drill (2)(3)	2yr	2yr	-	-	6m	-	6m	1yr	-
Synthetic parachute training (4)	2yr	2yr	2yr	2yr	-	-	2yr (8)	2yr (8)	-
Pool Training (5)									
Liferaft (primary) drill	1yr	1yr	-	1yr	1yr	1yr	6m	1yr	-
Parachute dragging	1yr	-	-	1yr	-	-	1yr (8)	-	-
Training at sea / Environmental Pool Trainer (6)(7)									
Parachute dragging	2yr	2yr	int/opp	2yr	-	-	2yr (8)	2yr (8)	-
Liferaft (primary) drill	2yr	2yr	int/opp	2yr	2yr	int/opp	2yr	int/opp	-
Multi seat liferaft drill (2)(3)	int/opp	int/opp	int/opp	int/opp	int/opp	int/opp	2yr	int/opp	-
Wet winching drill	int/4yr	int/opp	int/opp	int/opp	2yr	int/opp	2yr	int/opp	-
Escape Training (under water)									
STASS dry drill	-	-	-	-	-	-	6m	1yr	-
STASS wet drill	-	-	-	-	-	-	2yr	3yr	-
Underwater escape training	4yr	-	-	-	-	-	2yr	3yr	-

Legend

int	Initial drill to be as early as practicable in flying training
opp	On an opportunity basis
6 m	6 monthly
9 m	9 monthly
1 yr	Yearly
2 yr	2 Yearly
3 yr	3 Yearly
4 yr	4 Yearly

Notes

1. The ‘Maritime Role’ includes, but is not limited to, all those aircrew who, during their posting/appointment, could be called upon to serve at, to or from sea with up to 3 months notice, and all shore-based SAR aircrew.

2. Drill applies when the multi-seat liferaft is not the primary aircraft liferaft.

3. Helicopter crews who fly with both single and multi-seat liferafts are to carry out the drills for both.

4. Ground parachute dragging training is subsumed into synthetic parachute training.

5. Training may be conducted at sea.

6. As far as possible initial training should be done at sea.

7. Subsequent training may be conducted in an Environmental Pool Trainer, that has been approved for use by Aviation Duty Holders and AM(MF), or, if not available, at sea.

8. Drill applies when helicopter crews fly with parachutes.

9. ►Aviation Duty Holder and AM(MF) Orders **should** detail safety procedures for Ground Control Station (GCS) evacuation, such as making safe the GCS and provision for a safe recovery of the RPAS.◄

ANNEX B - Removed

ANNEX C - Removed

ANNEX D

MEDICAL SCREENING QUESTIONNAIRE PRIOR TO "STASS" WET DRILLS

PART A To be completed by the individual at his own unit.

PERSONAL DETAILS

SURNAME: ……

INITIALS: ……..

RANK/RATE: ……

SERVICE NUMBER: ……..

Date of last aircrew/periodic medical examination: ……..

MEDICAL CATEGORY A..... L..... M..... E.....

PART B To be completed by the individual at his own unit.

PAST MEDICAL HISTORY

Have you ever suffered from any of the following:		tick **YES**	or **NO**
B1.	Any lung disorder or abnormality.	…..	…..
B2.	Any heart disorder.	…..	…..
B3.	Any nervous system disorder.	…..	…..
B4.	A fractured skull.	…..	…..
B5.	A penetrating chest injury.	…..	…..
B6.	A collapsed lung.	…..	…..
B7.	Asthma.	…..	…..
B8.	Any form of recurring wheezing.	…..	…..
B9.	Have you ever had an operation on the heart.	…..	…..
B 10.	Have you ever had an operation on the chest or lungs.	…..	…..

If the answers to questions B1 to B10 are all **NO** go to **PART D**.

If any of the answers to questions B1 to B10 are **YES** go to **Part C**.

PART C. To be completed by the individual's Medical Officer.

Note: Guidance for Medical Officers on fitness for Wet STASS training is available in BR1750A (Handbook of Naval Medical Standards) Article 0604.4 (c) 6, 7, and 8 using the analogy of the CVS and respiratory criteria for submarine training. Specialist advice may be sought from the Head of Undersea Medicine at INM (Portsmouth Naval Base).

Applicability and more detailed information is contained in 2007 DIN 06-004.

I consider ……..

To be FIT* / UNFIT* for WET STASS training.

Date: …….. Signature: …… Appointment: ……...

PART D. To be completed by the individual on the day of the WET STASS training at the Underwater Escape Trainer.

I certify that I am not suffering from asthma or any chest disease and that I am able to clear my ears easily and without discomfort.

Date: …… Signature: ……..

Note: If the individual is unable to certify Part D on the day of training, he is to be referred to the Principal Medical Officer RNAS Yeovilton.

PART E. To be completed by the Principal Medical Officer RNAS Yeovilton.

I consider …… to be FIT / UNFIT * for Wet STASS training.

Date: …… Signature: ……..

PMO*
DPMO*
MO1*
MO2*

* Delete as necessary.

RA 2310 - Role Specific Fixed Wing

Rationale *Aspects of Fixed Wing roles require discrete and specific regulation.*

Contents

Regulation 2310(1)

Supersonic Flight

2310(1) Supersonic flight **shall** be specifically approved when not for operations, training, tests and trials.

Acceptable Means of Compliance 2310(1)

Supersonic Flight

1. **Approval Process**. The prior approval of the MOD (ACAS) **should** be obtained for supersonic flights carried out for other purposes, e.g. demonstrations, or when flights do not conform to these regulations. Requests for such flights are to be addressed to CAS-AS Strat 1 (MIL: 9621 83202 – CIV: 0207 218 3202).

2. **Conduct and Positioning of Supersonic Flights in the UK Flight Information Region (FIR)**. In the UK FIR, all supersonic flights **should** be conducted over the sea. Aircraft Commanders **should** ensure their aircraft is at least 10 nautical miles out to sea and along a line of flight at least 20º divergent from the mean line of the coast. When the purpose of a dive manoeuvre is to achieve supersonic flight, the angle of dive **should** not exceed the minimum necessary. Supersonic flights with the aircraft pointing towards the land, turning or flying parallel to the coast **should** take place at least 35 nautical miles from the nearest coastline. Low-level supersonic flight **should** only take place if a radar/visual search is maintained to avoid the following by the margins stated: 3 nm from shipping and fixed or mobile oil and gas installations; 6 nm from civilian or military transport aircraft, helicopters, helicopter main routes and corridors. If more than one radar unit is controlling within the same airspace, close co-ordination **should** be effected before any supersonic runs take place. Aircraft commanders that know or suspect that they have infringed any of these criteria **should** follow the reporting procedure for Inadvertent Supersonic Flight, below.

3. **Recording of Supersonic Flights**. With the exception of operational missions that require supersonic flight, Commanders **should** notify the appropriate radar station of all planned supersonic flights in advance. Where supersonic flights do not conform to the pre-flight briefing, Aircraft Commanders **should** make a record of the details of the supersonic flight in the flight authorization record. Similarly, radar stations **should** maintain a permanent record of supersonic flights carried out under their control. The permanent record **should** contain the following details:

   a. Aircraft type.

   b. Time period during which supersonic flight conducted.

   c. Heading and speed of aircraft (where known).

Acceptable Means of Compliance 2310(1)

d. Position (area in the case of sustained supersonic flight).

e. Altitude and attitude (where known).

4. **Inadvertent Supersonic Flight**. If any Aircraft Commander knows or suspects that his aircraft has inadvertently made a supersonic flight that breaches this regulation, he **should** make a permanent record, as listed above, of the breach in the flight authorization record. In addition, it is the responsibility of his parent unit concerned to notify the appropriate Control and Reporting Centre or Control and Reporting Point, Senior Military Supervisor at LATCC (Mil) or Naval Radar Unit of the flight within 30 minutes of the aircraft's landing. The radar station **should** maintain a record of all such occurrences.

5. **Supersonic Flights outside the UK FIR**. Supersonic flight **should** only be carried out in accordance with host nation regulations.

Guidance Material 2310(1)

Supersonic Flight

6. **Routine Supersonic Flight**. Aircraft may routinely fly at supersonic speed during Practice Intercept sorties or when taking part in exercises or during authorized training. Routine supersonic flight in the approved operating area need not be recorded as directed above.

7. **Supersonic Flights outside the UK FIR**. Where there are no host nation regulations, these UK regulations must be used.

Regulation 2310(2)

Aerobatics

2310(2) Incorporated into RA2309(9).

Acceptable Means of Compliance 2310(2)

Aerobatics

8. Incorporated into RA2309(9).

Guidance Material 2310(2)

Aerobatics

9. Incorporated into RA2309(9).

Regulation 2310(3)

Spinning

2310(3) Intentional spinning **shall** be prohibited in all aircraft unless specifically authorized.

Acceptable Means of Compliance 2310(3)

Spinning

10. Intentional spinning **should** be permitted only where clearance is given in the Release to Service (RTS) for the aircraft as reflected in the Aircraft Document Set (ADS) or, for non-RTS flying operations the Military Flight Test Permit or Certificate of Usage.

11. If still spinning by the minimum heights given in the ADS or, for non-RTS flying operations, the Military Flight Test Permit or Certificate of Usage, or higher if stipulated in Aviation Duty Holders' and AM(MF) Orders, the aircraft **should** be abandoned.

Guidance Material 2310(3)

Spinning

12. Nil.

Regulation 2310(4)

Asymmetric Power

2310(4) Airborne practice and simulated asymmetric flying **shall** be specifically approved and authorized.

Acceptable Means of Compliance 2310(4)

Asymmetric Power

13. Aviation Duty Holders and AM(MF) **should** promulgate orders that apply to practice and simulated asymmetric flight and stipulate; the minimum height for each aircraft type; the frequency of training; weather limitations; and, operating conditions.

14. The number of staff authorized to supervise asymmetric flying **should** be kept to a minimum.

15. Asymmetric approaches and landings **should** be practised only in weather conditions within the handling competence of the individual pilot under training. Other operating criteria for asymmetric flying training **should** be in accordance with specific aircraft operating procedures.

16. Simulated engine failure on take-off below 500 ft above ground or sea level **should** only be carried out under the direction of a suitably qualified and authorized aircrew instructor.

Guidance Material 2310(4)

Asymmetric Power

17. Due to the element of risk attached to asymmetric flying training, asymmetric practice will be closely supervised; training will be regular and limited to the amount necessary to achieve the aim. The aim of practice and simulated asymmetric flying is to ensure that pilots are capable of making safe, competent and confident approaches and landings should an unplanned asymmetric situation arise.

18. For the purposes of this regulation, practice asymmetric flying means the actual shutdown of a power unit(s); simulated asymmetric flying means the use of 'idle' or 'feather' for a power unit(s). Furthermore in accordance with RA2305(3), any practice asymmetric flying is only permissible if the RTS allows.

19. Flight on practice and simulated asymmetric power must be conducted in such a manner that safe flight can be continued in the event of a real engine failure.

20. Full-stop landings and touch-and-go landings following simulated asymmetric approaches and touchdowns may be carried out providing that approval for the aircraft type has been granted by the appropriate Aviation Duty Holder or AM(MF).

Regulation 2310(5)

Single-Engine Aircraft Engine Shutdowns

2310(5) Engine shutdowns and re-lights in single-engine aircraft **shall not** be carried out in the air, except where authorized for flight tests and trials.

Acceptable Means of Compliance 2310(5)

Single-Engine Aircraft Engine Shutdowns

21. Engine shutdowns and relights **should** only be carried out in single-engine aircraft when part of an approved Flight Test Schedule or MOD trials programme.

Guidance Material 2310(5)

Single-Engine Aircraft Engine Shutdowns

22. This Regulation does not apply to self-launching motor gliders ►or Remotely Piloted Air Systems (RPAS) that can only recover by means of a parachute.◄

Regulation 2310(6)

Air to Air Refuelling (AAR)

2310(6) Incorporated into RA2309(10)

Acceptable Means of Compliance 2310(6)

Air to Air Refuelling (AAR)

23. Incorporated into RA2309(10)

Guidance Material 2310(6)

Air to Air Refuelling (AAR)

24. Incorporated into RA2309(10)

Regulation 2310(7)

Electromagnetic and Cosmic Radiation

2310(7) Incorporated into RA2309(11)

Acceptable Means of Compliance 2310(7)

Electromagnetic and Cosmic Radiation

25. Incorporated into RA 2309(11)

Guidance Material 2310(7)

Electromagnetic and Cosmic Radiation

26. Incorporated into RA2309(11)

Regulation 2310(8)

Oxygen and Cabin Pressure

2310(8) Incorporated into RA2309(12)

Acceptable Means of Compliance 2310(8)

Oxygen and Cabin Pressure

27. Incorporated into RA2309(12)

Guidance Material 2310(8)

Oxygen and Cabin Pressure

28. Incorporated into RA2309(12)

Regulation 2310(9)

Altitude Limitations

2310(9) Incorporated into RA2309(13)

Acceptable Means of Compliance 2310(9)

Altitude Limitations

29. Incorporated into RA2309(13)

Guidance Material 2310(9)

Altitude Limitations

30. Incorporated into RA2309(13)

►This RA has been substantially re-written; for clarity no change marks are presented – please read RA in entirety◄

RA 4050 - Continuing Airworthiness of Remotely Piloted Air Systems (RPAS)

Rationale

It is necessary to effectively maintain the airworthiness of an RPAS; however, in order to ensure that resources are appropriately focused relative to the Risk to Life (RtL) that a system poses, the Continuing Airworthiness Engineering processes applied to a particular RPAS need to be tailored relative to its MAA Endorsed Categorization.

Contents

Regulation 4050(1)

RPAS Maintenance

4050(1) Aviation Duty Holders (DH) and Accountable Managers (Military Flying) (AM(MF)) **shall** ensure that their RPAS are maintained in accordance with (iaw) the regulatory requirements defined in RA4000 to RA4849.

Acceptable Means of Compliance 4050(1)

RPAS Maintenance

1. For RPAS categorized as Class II or III then:

   a. For those maintained by a Military Maintenance Organization (MMO) the Acceptable Means of Compliance (AMC) stated in RA4000 to RA4849 **should** be followed, noting that these RAs in turn refer to the Manual of Maintenance and Airworthiness Processes (MAP-01).

   b. For those maintained by a MAA Regulatory Publication (MRP) Part 145 Approved Maintenance Organization (AMO) the AMC stated in RA4800 - 4825: MRP Part 145 **should** be followed.

2. For RPAS categorized as either Class I(b), I(c) or I(d) the Chief Air Engineer (CAE) to the Operating DH (ODH), or AM(MF) may authorize deviation from the procedures detailed in the MAP-01, for the items listed below:

   a. Ground Handling (RA4054 - Ground Handling of Aircraft and MAP-01 Chapter 2.5).

   b. Engineering Authorizations (RA4806(5) - Personnel Requirements (MRP 145.A.30); RA4807(2), RA4807(3), RA4807(9), RA4807(13) - Certifying Staff and Support Staff (MRP 4807(1): Staff Knowledge (MRP 145.A.35(a)) 145.A.35); and MAP-01 Chapter 4.3 - Engineering Authorizations).

   c. Maintenance by non-engineering tradesmen (RA4806(10) - Personnel Requirements (MRP 145.A.30) and MAP-01 Chapter 4.3 - Engineering Authorizations).

   d. Tool Control (RA4808 - Equipment Tools and Material (MRP145.A.40) and MAP-01 Chapter 6.1 - Management of Hand Tools and Test and Measuring Equipment).

   e. Independent Inspections (RA4815(2) - Maintenance Procedures and

Acceptable Means of Compliance 4050(1)

Safety and Quality Policy (MRP 145.A.65) and MAP-01 Chapter 6.10 - Aircraft Independent Inspections).

f. Aircraft Maintenance Documentation (RA4813 - Maintenance Records (MRP 145.A.55) and MAP-01 Chapters 7.1 - Certification of Aircraft Maintenance Documentation and 7.2 - Recording of Aircraft Maintenance).

Such deviations **should** be recorded in the Station/Ship/Unit Aviation Engineering Standing Orders (AESOs) or in the Defence Contractor Flying Organization's Operations Manual outlining the basis for judgement.

3. Flight Servicing **should not** be waived for RPAS.

Guidance Material 4050(1)

RPAS Maintenance

4. RPAS will be categorized iaw RA1600 – RPAS.

5. For RPAS categorized as Class II or III it is expected that the system will be maintained iaw the policy and procedural requirements applicable to manned aircraft.

6. For RPAS categorized as Class I(b), I(c) or I(d) it is recognized that wholesale application of the processes detailed in the MAP-01 is neither proportionate nor effective. Consequently, for the specific areas detailed in paragraph 2, although the requirement of the RAs is to be met, the Aviation DH or AM(MF) is able to authorize the use of alternative processes that achieve the same outcome. These alternative processes must be detailed in local AESOs or the Defence Contractor Flying Organization's Operations Manual, noting their appropriate endorsement.

7. For all RPAS[1] categories there may be ground-based elements of the system for which maintenance practices need not adhere to the MRP. These items will be specifically identified by the Type Airworthiness Authority (TAA) and recorded in the Air System Document Set (ADS) along with their appropriate maintenance procedures.

Regulation 4050(2)

Maintenance Organizations for RPAS

4050(2) The Continuing Airworthiness Management Organization (CAMO) **shall** ensure that RPAS categorized as Class I(d), II or III are maintained by a MMO or AMO iaw RA1005 - Competent Organizations and Responsibilities and the RA4800 - 4825: MRP Part 145.

For RPAS categorized as Class I(b) or I(c), in lieu of an approval, the Delivery DH (DDH) or AM(MF) **shall** ensure that the maintenance organization implements a recognized quality system.

Acceptable Means of Compliance 4050(2)

Maintenance Organizations for RPAS

For RPAS categorized as Class I(d), II or III

8. For RPAS categorized as Class I(d), II or III then the MMO or AMO **should** follow AMC stated in RA4800 - 4825: MRP Part 145.

For RPAS categorized as Class I(b) or I(c)

9. The maintenance organization maintaining RPAS categorized as Class I(b) or

[1] As per RA1600 – RPAS, the phrase "all RPAS" will refer to "all RPAS less those categorized as Class I(a)" throughout this RA.

Acceptable Means of Compliance 4050(2)

I(c) **should** implement a quality system which is either:

a. Implemented iaw MAP-01 Chapter 15 - Quality Assurance; or,

b. Certified to comply with ISO 9001 or AS 9100.

Guidance Material 4050(2)

Maintenance Organizations for RPAS

For RPAS categorized as Class I(d), II or III

10. Nil.

For RPAS categorized as Class I(b) or I(c)

11. Nil.

Regulation 4050(3)

Continuing Airworthiness Management of RPAS

4050(3) For RPAS categorized as Class II or III the DDH/AM(MF) **shall** ensure that the airworthiness of the Air System is managed by an approved CAMO iaw RA4900 - 4956: MRP Part M Sub Part G.

For RPAS categorized as Class I(b), I(c) or I(d) operated in the Service Environment[2] the DDH CAE **shall** manage the continuing airworthiness of the Air System.

For RPAS categorized as Class I(b), I(c) or I(d) operated outside of the Service Environment the AM(MF) **shall** appoint a Suitably Qualified and Experienced Personnel (SQEP) individual to manage the continuing airworthiness of the Air System.

Acceptable Means of Compliance 4050(3)

Continuing Airworthiness Management of RPAS

For RPAS categorized as Class II or III

12. For CAMOs supporting Aviation DHs responsible for managing RPAS categorized as Class II or III, AMC detailed in RA4900 - 4956: MRP Part M Sub Part G **should** be followed.

13. For Defence Contractor Flying Organizations operating RPAS categorized as Class II or III then, iaw RA1121 - Air Safety Arrangements for Military Registration of Civil-Owned Aircraft not operated in the Service Environment, the AM(MF) will be supported by an approved CAMO which **should** follow AMC stated in RA4900 - 4956: MRP Part M Sub Part G; however, in derogation to RA4945(2) - Personnel Requirements, the CAM is not required to be a Crown Servant.

For RPAS categorized as Class I(b), I(c) or I(d) operated in the Service Environment

14. For RPAS categorized as Class I(b), I(c) or I(d) operated in the Service Environment, the CAE to the DDH **should**:

[2] As per MAA 02 - Aircraft are deemed to operate in the Service Environment when there is a Release To Service (RTS) and a Aviation DH responsible for RtL

Acceptable Means of Compliance 4050(3)

a. Develop a set of AESOs iaw MAP-01 Chapter 1.10.2 which details the organizations that provide maintenance support to the RPAS and defines the procedures to be followed.

b. Demonstrate adequate oversight of the maintenance activities undertaken on the RPAS within his area of responsibility (AoR) through ensuring implementation of a quality system iaw MAP-01 Chapter 15, which will provide assurance to the Aviation DH of compliance with RA4050(1). The audit programme **should** include an appropriate sample audit of the airworthiness of individual platforms in lieu of a MARC, see RA4050(4).

For RPAS categorized as Class I(b), I(c) or I(d) operated outside of the Service Environment

15. For Defence Contractor Flying Organizations the individual appointed to manage the continuing airworthiness of RPAS categorized as Class I(b), I(c) or I(d) **should** meet the following criteria:

a. Be a professionally registered engineer, either:

(1) IEng level where he is supervised by another professionally registered CEng; or,

(2) CEng level where he operates without supervision.

b. Have familiarity with the MRP 4000 series (Continuing Airworthiness Engineering).

c. Specifically for RPAS categorized as Class I(c) or I(d) have at least 4 years' relevant aviation experience.

16. For RPAS categorized as Class I(b), I(c) or I(d) operated outside the Service Environment, the individual appointed to manage the continuing airworthiness **should**:

a. Provide input to the organization's Operations Manual detailing the organizations that provide maintenance support to the RPAS and defining the procedures to be followed;

b. Demonstrate adequate oversight of the maintenance activities undertaken on the RPAS within his AoR through ensuring implementation of a quality system which meets the requirements of RA4050(2). The audit programme **should** include an appropriate sample audit of the airworthiness of individual platforms in lieu of a MARC, see RA4050(4).

Guidance Material 4050(3)

Continuing Airworthiness Management of RPAS

For RPAS categorized as Class II or III

17. Nil.

For RPAS categorized as Class I(b), I(c) or I(d) operated both within and outside of the Service Environment

18. For RPAS categorized as Class I(b), I(c) or I(d), there is still a responsibility to maintain the integrity of such systems despite the fact that a CAMO need not be appointed. Consequently continuing airworthiness management practices will be applied where applicable and the CAE or individual appointed to manage the continuing airworthiness of RPAS may review the CAMO responsibilities defined in RA4947 - Continuing Airworthiness Management: MRP Part M Sub Part G, for reference. It is for the CAE, or the individual appointed by the AM(MF), to manage the continuing airworthiness of the RPAS, to implement quality systems and procedures and to provide assurance to their DDH / AM(MF). And while there is not a requirement

Guidance Material 4050(3)

to achieve an approval in their own right, their activity will be subject to oversight by the MAA through audits of the DDH / AM(MF).

Regulation 4050(4)

MARC for RPAS

4050(4) For RPAS categorized as Class II or III, operated in the Service Environment, the DDH **shall** ensure that the RPA is operated with a valid MARC iaw RA4970 - 4974: MRP Part M Sub Part I.

Acceptable Means of Compliance 4050(4)

MARC for RPAS

19. For RPAS categorized as Class II or III, operated in the Service Environment, the CAMO **should** follow AMC detailed in RA4970 - 4974: MRP Part M Sub Part I.

Guidance Material 4050(4)

MARC for RPAS

20. For RPAS categorized as Class I(b), I(c) or I(d) the CAE to the DDH, or the individual appointed to manage the continuing airworthiness of RPAS in a Defence Contractor Flying Organization, will implement a sample audit of the airworthiness of individual platforms in lieu of the MARC as stated in AMC to RA4050(3).

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RA 5002 - Remotely Piloted Air Systems (RPAS) Design and Modification Engineering (DME) Regulations

Rationale

There is a requirement to define the responsibility and authority for design and modification of RPAS through either Service or contractor organizations.

Contents

Regulation 5002(1)

Compliance with 5000 Series RAs

5002(1) The Type Airworthiness Authority (TAA) **shall** ensure that all RPAS[1] Design and Modifications are carried out in accordance with (iaw) the 5000 Series DME RAs. Where there is a difference between the regulation contained in this document and any other 5000 Series DME RA this RA takes precedence for RPAS platforms.

Acceptable Means of Compliance 5002(1)

Compliance with 5000 Series RAs

1. The regulations listed in the contents section of this RA are adjusted to account for RPAS methods of design, construction, certification and most importantly, reduced Risk to Life (RtL). Hence this regulation **should** be followed for all classes of RPAS.

Guidance Material 5002(1)

Compliance with 5000 Series RAs

2. Nil.

[1] As per RA 1600 – RPAS, the phrase “all RPAS” will refer to “all RPAS less those categorized as Class I(a)” throughout this RA.

Regulation 5002(2)

Certification of Design

5002(2) For all RPAS, other than those identified below, the TAA **shall** comply with RA5103 - Certification of Design.

For RPAS categorized as Class I(b) or I(c) that are Commercial Off-The-Shelf (COTS), the TAA **shall** ensure the intent of RA5103 - Certification of Design is achieved.

Acceptable Means of Compliance 5002(2)

Certification of Design

3. For RPAS categorized as Class I(d), II or III, RA 5103 **should** be complied with in its entirety.

4. For RPAS categorized as Class I(b) or I(c) that are COTS, any recognized design standards used during development of the platform **should** be recorded. If the RPAS is not designed to any recognized airworthiness standards, the onus is on the TAA to demonstrate how product integrity is achieved. This argument **should** be contained within the Equipment Safety Assessment.

5. For RPAS categorized as Class I(b) or I(c) that are not COTS, Appendix A1 or A2 of RA 5103 **should** be completed, but is only required to include as a minimum:

a. The RPA type.

b. A list of all relevant standards that were used during the design (ie any software design standards, European Aviation Safety Agency Certification Specifications, Joint Aviation Requirements, etc).

c. A statement regarding the testing or analysis performed to ensure the Software and Structural Integrity of the platform; reference **should** also be made to the Equipment Safety Assessment.

Guidance Material 5002(2)

Certification of Design

6. Depending on the categorization of an RPAS, it is possible that a platform will not be designed to any recognized certification standards. The onus is on the TAA to ensure that the RPA is still safe to operate within the limitations of the RTS.

7. Development of a robust Air System Safety Case (SC) is critical for platforms that are not required to undergo a formal certification process, ie for RPAS categorized as Class I(b) or (1c). RA 1600 - RPAS Annex B provides further guidance on the requirements for platforms not undergoing formal certification, with a list of suggested criteria.

Regulation 5002(3)

Software Design Assurance

5002(3) For RPAS categorized as Class I(d), II or III, the TAA **shall** comply with Software Design Assurance Levels (DAL) required by Def Stan 00-970, Part 9.

For RPAS categorized as Class I(b) or I(c), a hazard analysis **shall** be completed to demonstrate software assurance.

Acceptable Means of Compliance 5002(3)

Software Design Assurance

8. The level of software assurance for Class I(b) or I(c) RPAS **should** be established by an appropriate hazard analysis as required by Def Stan 00-970, Part 9.

Guidance Material 5002(3)

Software Design Assurance

9. It is recognized that for RPAS categorized as Class I(b) or I(c), it may not be reasonably practicable to meet the Software DAL called out in Def Stan 00-970, Part 9. In such cases the MAA will agree the software assurance strategy that would be used to develop the software argument in the Equipment Safety Assessment, giving particular attention to software items whose failure could lead to uncontrolled flight and/or a catastrophic loss.

Regulation 5002(4)

Mass, CofG and Associated Data of RPA

5002(4) The TAA **shall** ensure that RA 5212 - Mass, CofG and Associated Data of Aircraft is complied with for RPAS categorized as Class I(d), II or III.

The TAA **shall** ensure that a method is in place for maintaining the weight and balance of each individual RPA for RPAS categorized as Class I(c).

Acceptable Means of Compliance 5002(4)

Mass, CofG and Associated Data of RPA

10. For RPAS categorized as Class I(c), the TAA **should** develop and maintain a procedure in the Air System Document Set (ADS) for checking the weight and balance of the RPA prior to flight.

Guidance Material 5002(4)

Mass, CofG and Associated Data of RPA

11. For RPAS categorized as Class I(c), it is common practice that the design enables operators to routinely exchange components for repair purposes. For some platforms, the weight is controlled by limiting the extent of repairs carried out. As such, the weight and balance for platforms within the Class I(c) category is traditionally checked after assembly, and/or prior to every flight.

12. The onus is on the TAA to ensure that effective weight and balance control measures are in place for the platform to ensure the weight and balance remains within limits.

13. For RPAS categorized as Class I(b), a process is not required for maintaining the weight and balance of the platform.

Regulation 5002(5)

Reporting of Mass for RPA Equipment

5002(5) The TAA **shall** ensure that RA5205 - Reporting of Mass for Aircraft Equipment is complied with for RPAS categorized as Class I(d), II or III.

The TAA **shall** ensure that the mass of RPA equipment is recorded, listing all installed/removable equipment for RPAS categorized as Class I(c) prior to the RTS.

Acceptable Means of Compliance 5002(5)

Reporting of Mass for RPA Equipment

14. For RPAS categorized as Class I(c), the TAA **should** ensure that the mass of any installed equipment and systems is reported in the forms described in RA5205 - Reporting of Mass for Aircraft Equipment before the RTS of the RPAS. A single submission is acceptable.

Guidance Material 5002(5)

Reporting of Mass for RPA Equipment

15. For RPAS categorized as Class I(c), role fit equipment may not be applicable; however, there must still be a method for weight and balance to be easily checked by the operators prior to flight.

Regulation 5002(6)

Configuration Management – Project Team

5002(6) The TAA **shall** have a Configuration Management Plan in place for all items of materiel that may be subject to modification for RPAS categorized as Class I(d), II or III.

For RPAS categorized as Class I(c) the TAA **shall** have a tailored Configuration Management Plan.

Acceptable Means of Compliance 5002(6)

Configuration Management – Project Team

16. For RPAS categorized as Class I(d), II or III the AMC in RA5301 - Control of Designs **should** be followed.

17. For RPAS categorized as Class I(c), a documented process for controlling the configuration of all items that would affect the Equipment Safety Assessment **should** be provided.

Guidance Material 5002(6)

Configuration Management – Project Team

18. For RPAS categorized as Class I(b) or I(c), maintaining configuration control can require a high level of effort. Due to the reduced RtL associated with these platforms and the conditions and limitations that they are operated under, the benefits of a robust Configuration Management Plan may not provide significant gains to the safety of the platform.

19. For these reasons, the requirements outlined in RA5301 - Control of Designs are not mandated; however, for any item that may affect the Equipment Safety Assessment a documented process will be utilized.

Regulation 5002(7)

Design and Certification of RPA Engines

5002(7) For RPAS categorized as Class I(d), II or III, the TAA **shall** comply with RA5601 - Design and Certification of Aircraft Engines.

For RPAS categorized as Class I(b) or I(c), the TAA **shall** ensure an evaluation process is carried out for the engine, and is outlined in the Equipment Safety Assessment iaw RA1220(2) - Project Team Airworthiness and Safety.

Acceptable Means of Compliance 5002(7)

Design and Certification of RPA Engines

20. For RPAS categorized as Class I(b) or I(c):

a. Where RA5601 - Design and Certification of Aircraft Engines cannot be complied with, an evaluation process **should** be conducted on the engine to demonstrate that an appropriate level of safety can be achieved. The evaluation **should** form part of the Equipment Safety Assessment prepared iaw RA1220 (2) - Project Team Airworthiness and Safety.

b. For COTS engines, any recognized design standards and qualification evidence used during development of the platform **should** be recorded. If the engine is not designed to any recognized airworthiness standards the onus is on the TAA to reference how product integrity is achieved. This argument **should** be contained within the Equipment Safety Assessment.

Guidance Material 5002(7)

Design and Certification of RPA Engines

21. For RPAS categorized as Class I(b) or I(c), it is possible that an engine will not be designed to any recognized certification standards and have limited qualification compliance reports. The onus is on the TAA to ensure that the engine is still safe to operate within the limitations of the RTS.

22. Development of a robust Equipment Safety Assessment is critical for engines that are not required to undergo a formal certification process. An evaluation process will be conducted on the engine and, if applicable, its associated control, monitoring, fuel and cooling systems, to demonstrate that an appropriate level of safety can be achieved that will meet the Design Safety Target. RA1600 - RPAS provides further guidance on the requirements for platforms not undergoing formal certification, with a list of suggested criteria to be covered in Annex B.

Regulation 5002(8)

Engine Specification

5002(8) For all RPAS, the TAA **shall** comply with the Engine Specification requirements detailed in Def Stan 00-970, Part 9.

Acceptable Means of Compliance 5002(8)

Engine Specification

23. The TAA **should** comply with Def Stan 00-970, Part 9 for Engine Specifications for all RPAS.

Guidance Material 5002(8)

Engine Specification

24. Nil.

Regulation 5002(9)

Mass and CofG Data of RPA Engines and Jet Pipes

5002(9) The TAA **shall** comply with RA5607 - Mass and CofG Data of Aircraft Engines and Jet Pipes, Mass and CofG Data of RPA Engines and Jet Pipes, for RPAS categorized as Class I(d), II or III.

The TAA **shall** ensure that a method is in place for maintaining the weight and balance of each individual RPA for RPAS categorized as Class I(b) or I(c).

Acceptable Means of Compliance 5002(9)

Mass and CofG Data of RPA Engines and Jet Pipes

25. For RPAS categorized as Class I(b) or I(c), the TAA **should** ensure there is a procedure for checking the weight and balance of the RPA engine(s) and jet pipe, if applicable, prior to flight.

Guidance Material 5002(9)

Mass and CofG Data of RPA Engines and Jet Pipes

26. For RPAS categorized as Class I(b) or I(c), it is common that the design enables operators to routinely exchange components, including engines, between individual platforms. As such, the weight and balance for platforms within the Class I(b) or I(c) category is traditionally checked after assembly, and/or prior to every flight.

27. The onus is on the TAA to ensure that effective weight and balance control measures are in place for the platform to ensure the weight and balance remains within limits.

Regulation 5002(10)

Production Procedures for RPA Engines and Associated Equipment

5002(10) The TAA **shall** comply with RA5615 - Production Procedures for Engines and Associated Equipment for Engine Production Procedures for RPAS categorized as Class II or III.

Acceptable Means of Compliance 5002(10)

Production Procedures for RPA Engines and Associated Equipment

28. For RPAS categorized as Class II or III, AMC to RA5615(1) and AMC to RA5615(2) **should** be followed.

Guidance Material 5002(10)

Production Procedures for RPA Engines and Associated Equipment

29. For RPAS categorized as Class II or III, refer to GM to RA5615(1) and GM to RA5615(2)

30. For RPAS categorized as Class I(b), I(c) or I(d), there is no requirement to comply with RA5615.

Regulation 5002(11)

RPAS Integrity Management

5002(11) The TAA **shall** ensure that all RPAS are managed to ensure acceptable and demonstrable levels of Structural, System and Propulsion Integrity.

Acceptable Means of Compliance 5002(11)

RPAS Integrity Management

31. The plan for Integrity Management of the RPAS **should** be presented to the MAA by the TAA. Subject to the assessment carried out as part of the Equipment Safety Assessment for the RPAS, which recognizes the potential outcome of loss of continuing airworthiness, the TAA **should** apply the principles of the RA5700: Integrity Management series of to ensure airworthiness is maintained through the life of the RPAS.

32. For RPAS categorized as Class I(c), a tailored Integrity Management approach **should** be carried out by the TAA.

33. For RPAS categorized as Class I(d), II or III, the TAA **should** follow the Establish, Sustain, Validate, Recover, Exploit (ESVRE) approach for Integrity Management as outlined in RA5720(1-6) - Structural Integrity Management, RA5721(1-6) - System Integrity Management, and RA5722(1-6) - Propulsion Integrity Management.

Guidance Material 5002(11)

RPAS Integrity Management

34. For RPAS categorized as Class II or III the requirements for Integrity Management are no different from those for manned aircraft.

35. For RPAS categorized as Class I(d), the requirements for Integrity Management are no different than manned aircraft with the exception of the requirement for Onboard Load Monitoring/Onboard Data Recording (OLM/ODR) programmes. These programmes are implemented on the platform at the discretion of the TAA. When determining whether to implement an OLM programme, the TAA ought to consider whether the usage is sufficiently limited by flight control and any self-protection systems so that flight outside the scope of the Design Usage Spectrum (DUS) articulated in the Statement of Operating Intent (SOI) is prevented.

36. For RPAS categorized as Class I(c) the TAA may chose to amalgamate Structural, System and Propulsion Integrity as an alternative to managing the ESVRE activities and Integrity Working Groups (IWG) of these specialties individually. The

Guidance Material 5002(11)

complexity of the Air System will determine whether it is more economical for the TAA to group them together or follow a traditional approach for Integrity Management. It is therefore acceptable for the TAA to run combined IWGs.

37. For RPAS categorized as Class I(b) or I(c), where the propulsion system is not a combustion engine, the propulsion system will be classed as a system iaw RA5721 - System Integrity Management.

38. For RPAS categorized as Class I(c), the TAA may waive the requirement for a Propulsion Integrity Working Group when the engine(s) are not considered a distinct system. In this case Propulsion Integrity will fall under System Integrity.

39. Table 1 lists the minimum requirements for Platform Integrity Management for RPAS categorized as Class I(c).

40. For RPAS categorized as Class I(b), specific Integrity Management activity is not required.

Regulation 5002(12)

RPAS Ageing Aircraft Audit

5002(12) The TAA **shall** ensure that consideration is given to the effects of degradation and the interaction of apparently unrelated ageing processes for all RPAS.

Acceptable Means of Compliance 5002(12)

RPAS Ageing Aircraft Audit

41. All RPAS categorized as Class II or III **should** be subjected to an Ageing Aircraft Audit (AAA) iaw RA5723 - Ageing Aircraft Audit, to give confidence that airworthiness risks are at least tolerable and As Low As Reasonably Practicable (ALARP), as the fleet ages and regulatory requirements evolve. This evaluation **should** consider all elements of the Air System which includes the Ground Control Station.

42. For all RPAS categorized as Class I(c) or I(d), sufficient proof **should** be obtained by the TAA to ensure that degradation and the interaction of apparently unrelated ageing processes are accounted for and that any associated risks are being mitigated appropriately.

Guidance Material 5002(12)

RPAS Ageing Aircraft Audit

43. All RPAS with an anticipated service life of less than 6 years are exempt the requirements of an Ageing Aircraft Audit.

44. The risk to airworthiness due to the ageing of aircraft in service is partly mitigated by Integrity Management iaw RA5720 - Structural Integrity Management, RA5721 - System Integrity Management and RA5722 - Propulsion Integrity Management. However, the unpredictable nature of degradation and the interaction of apparently unrelated ageing processes are often found only by an additional rigorous periodic audit of trend data, procedures and the RPAS's physical condition.

45. For RPAS categorized as Class II or III, the requirements are no different to those applied to manned aircraft. However for RPAS categorized as Class I(c) or I(d), the Air System may have inherent design characteristics which would reduce the requirement for demonstrable proof of system integrity as the Air System ages (ie components that are inspected after every flight and replaced on condition, solid foam construction with no hidden critical structure, etc).

46. For Class I(c) or I(d) RPAS, there is still a requirement to adequately assess any risks, implications, and milestones for re-evaluation. SME input may be required for RPAS structure, aircraft systems, propulsion systems and any RPA service history trend analysis (if applicable).

ANNEX A

Tailored Integrity Management Class I(c) RPAS

Table 1 – Tailored Integrity Management Class I(c) RPAS

Platform Integrity Class I(c)
In preference to separate IM as required by RAs 5720, 5721 and 5722 the TAA may assure IM via a tailored whole platform approach. A combined IM approach will ensure the intent of the individual RAs is met and it is expected that this is delivered via a suitable management framework such as ESVRE. The whole platform approach will also include as a minimum: **Establish** – A tailored Platform Integrity Strategy Document (ISD) and SOI. All elements of the RPAS that contribute to safe operation including ground control stations will be included within the IM strategy. **Sustain** – A framework that includes: an Integrity Management Plan and Integrity Management Working Groups that will provide continuing airworthiness for all elements of the air system. A system must be in place to determine and control RPA mass, CofG, and mass distribution. **Validate** – SOIU review required every 2 years, OLM/ODR programmes will not be required where the Class I(c) RPAS usage can be shown to be sufficiently limited by flight control or similar self-protection systems such that flight outside the scope of the DUS articulated in the SOI is prevented. **Recover** - Damage and repairs will be recorded with enough fidelity to permit a fleet-wide assessment of structural health. Reviews of component lifing will be carried out, particularly where components that do not have individual lifing records may be moved between RPA and may exceed their original cleared life. **Exploit** – Undertake structural Hazard and Accident analysis in the event of airworthiness risks arising from Structural Integrity concerns.