

## INTRODUCTION

On 19 January 2015 the Military Aviation Authority (MAA) concluded a 15 month, end-to-end review of Remotely Piloted Air System (RPAS) regulations with the introduction of a bespoke Regulatory Framework. This marked a significant milestone for the MAA as it not only formalised RPAS regulation as distinct from manned aircraft but also streamlined the process by which RPAS are introduced into Defence.

## BACKGROUND

RPAS, also known as Unmanned Aerial Vehicles (UAVs), have been a feature of military aviation since World War I and their regulation, where appropriate, had essentially been an adaptation of regulations for manned aircraft. Whilst these were adequate for a small inventory in a predominantly test environment, the increasing employment of RPAS and proliferation of small air vehicles highlighted the need to review the application of regulations to RPAS. Specifically, legacy regulations did not adequately reflect the risk to life (RtL) that smaller RPAS posed, their mode of operation and even their means of procurement compared to manned platforms.

## THE RPAS MULTI-DISCIPLINARY TEAM AND WRITING THE REGULATIONS

In September 2013, in recognition of the need to develop a more proportionate and effective regulatory regime for RPAS, the MAA formed a Multi-Disciplinary Team (MDT), drawing on individuals from across the organisation. The Team was tasked to conduct an end-to-end review of RPAS regulations and to make recommendations for a more appropriate regulatory regime.

The RPAS stakeholder community is extensive and includes Front Line Commands, MOD agencies and Industry as well as civilian regulators with whom the MDT worked closely throughout the review. Key stakeholders were invited to establish 'tiger team' panels to deep-dive into key areas of regulation and the wider RPAS community was invited to comment on early drafts prior to official release for wider consultation. This highly consultative approach, whilst novel, was entirely appropriate for the task and ensured an efficient and effective drafting and review process. Furthermore, dialogue with the Civil Aviation Authority (CAA) and other NATO regulators ensured alignment and proportionality with emerging global regulatory sets.

## CATEGORISATION

Traditionally categorised according to their Maximum Take-Off Weight (MTOW), RPAS are commonly referred to in terms of: Nano, Micro, Mini, Small, Tactical, Medium/High Altitude Long Endurance (M/HALE), Strike and Combat. Within the newly established MAA system, RPAS are categorised into 6 classes: Classes I(a-d) for the smallest RPAS and Classes II and III for the largest. The relationship between the MAA and NATO categories is illustrated in Table 1.

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

Table 1 – MAA/NATO Class and Common Taxonomy

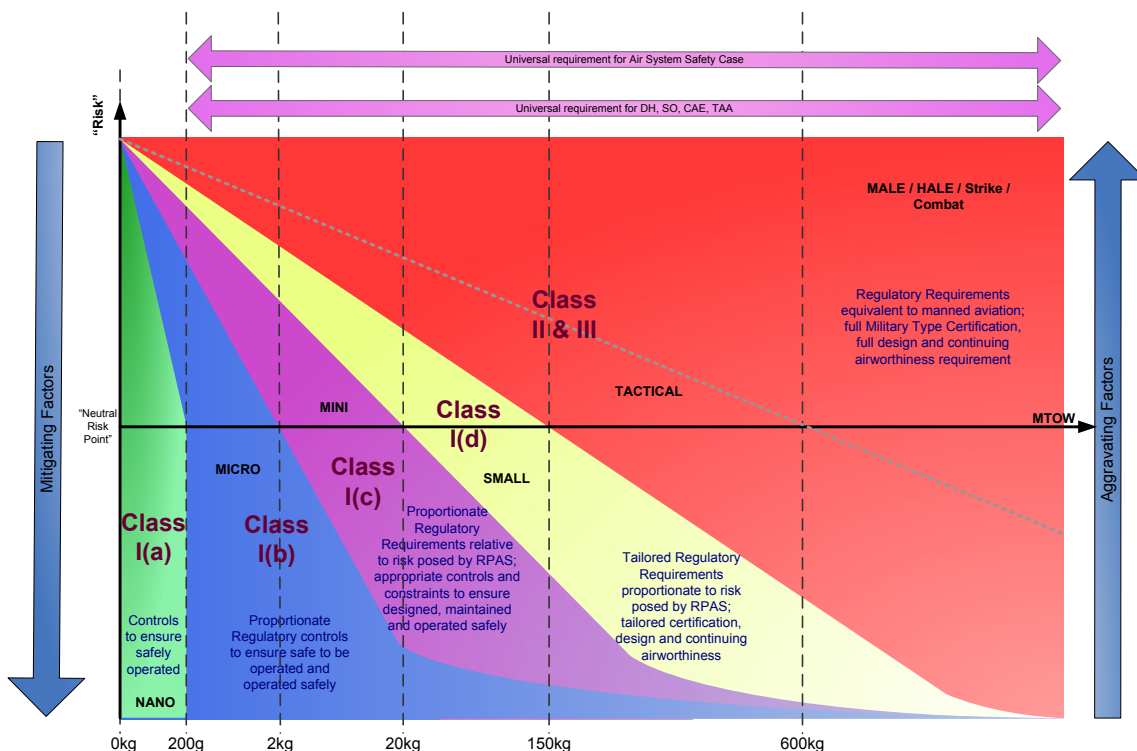
All RPAS destined for use in the Defence Air Environment, regardless of size, must be presented to the MAA for categorisation. The categorisation of an RPAS determines the regulatory regime that must be complied with, from light touch for Class I(a) to full compliance with the MAA Regulatory Publications (MRP) for classes II and III. This sliding scale regulatory regime offers significant potential benefits to smaller RPAS.

Whilst MTOW is used as the starting point for MAA RPAS categorisation, it is the intended use and operation of the RPAS that is considered to be a potentially more significant factor in understanding the 2<sup>nd</sup> and 3<sup>rd</sup> party RtL. As such, the MAA has developed a more flexible and proportionate system that takes into consideration the characteristics of the RPAS in its operating context and any mitigating and aggravating factors in the RPAS's mode of employment, some examples of which are listed in Table 2.

Mitigating Factors	Aggravating Factors
<ul style="list-style-type: none"> <li>• Operation in Visual Line of Sight (VLOS)</li> <li>• Operation in Segregated Airspace</li> <li>• Over flight of low population density</li> <li>• Flight termination system</li> <li>• Redundancy</li> <li>• Frangibility of RPAS structure</li> </ul>	<ul style="list-style-type: none"> <li>• Extended range operation Beyond VLOS (BVLOS)</li> <li>• Operation in non-Segregated Airspace</li> <li>• Over-flight of congested areas / high population density</li> <li>• Weaponisation</li> <li>• Failure mode - high Kinetic Energy</li> <li>• Complexity</li> </ul>

**Table 2 - Categorisation Aggravating and Mitigating Factors**

By applying these factors to the MTOW categorisation starting point, it is possible for an RPAS to move up or down the categories into one with a more appropriate regulatory regime. Figure 1 is an illustration of the relative positions of each of the categories, the regulatory regime applicable for each category and shows how the bounds of each category can be expanded beyond the standard MTOW parameters. Whilst specific examples cannot be given, the intent of the categorisation system is to ensure that an inappropriately complex regulatory regime is not imposed on an RPAS by virtue of its MTOW. Conversely, it may be considered appropriate to subject a small RPAS to a more demanding regulatory regime if its activity is assessed to increase the RtL.



**Figure 1 - MAA Regulatory Categorisation Schematic (for illustrative purposes only)**

On receipt of an RPAS Categorisation Submission, the MAA will form a Categorisation Team composed of desk officers with experience and expertise appropriate to the RPAS seeking categorisation. As a minimum there will be an RPAS operator and members from the areas of Continuing Airworthiness, Design Airworthiness and Certification with additional participation from MAA legal staff as required. Under normal circumstances the MAA categorisation process should take no longer than 30 working days from receipt of the categorisation submission to issuing a Letter of Endorsed Categorisation. If further information is required to make an assessment then the 30 day countdown will be paused until the information is received and the categorisation process can resume. The information required for categorisation is detailed in the MRP<sup>1</sup>.

## **RECREATIONAL USE OF RPAS**

The MRP does not apply to the use of RPAS on military property by individuals or organisations which would be considered private, sport or recreation such as model aircraft flying clubs<sup>2</sup>. That said, it still remains the responsibility of the RPAS operator to ensure that they meet any restrictions imposed at the operating location by the Head of Establishment as well as to review and comply with CAA RPAS regulations.

The CAA does not currently require RPAS <20kg (including attachments but not fuel) which have been purchased and flown for leisure purposes to gain airworthiness, registration or operating approvals. Operators of these RPAS are advised to familiarise themselves with the CAA regulations for recreational use of RPAS which have been distilled into poster format<sup>3</sup> for easy display and reference and are summarised below:

- The RPAS operator is legally responsible for the safe conduct of each flight and must ensure that the RPAS is not only safe to fly but is flown in a manner that does not endanger anyone or anything.
- The RPAS should remain in sight at all times.
- The RPAS must not be operated in congested areas such as streets, towns and cities and must not be flown within 50m of people, vehicles or buildings and structures.
- If the RPAS has a camera attached the RPAS operator must ensure that privacy laws and the Data Protection Act are not breached.

## **FUTURE ACTIVITY - PROLIFERATION**

The scope of the MDT was to conduct a review of current RPAS regulations; it was recognised however that this would necessarily be only the first step on a longer journey as the use of RPAS continues to evolve. In particular, the proliferation of small RPAS such as Quadcopters procured at unit level for specific tasks such as surveying exercise areas or aerial photography was identified as an area for future consideration. The MAA has initiated further work strands to ensure that RPAS regulations address the needs of the Regulated Community.

## **CONCLUSION**

It is anticipated that the introduction of these new, proportionate and pragmatic regulations will stimulate greater engagement with the MAA and enhance awareness of regulations across the whole RPAS community of operators. A much clearer regulatory regime has established the foundations for the next generation of RPAS in the Defence Air Environment and will help unlock the vast potential of this critical capability in the future.

---

<sup>1</sup> Regulatory Article 1600(2) and MAA03 Annex F provide full detail and guidance on the categorisation process – both can be accessed via the [MAA website](#).

<sup>2</sup> [CAA website](#) for unmanned aircraft

<sup>3</sup> The [poster](#) can be found on the CAA website in the area 'Safety Rules – a basic guide'.