RPAS Policy Team

UK Civil Aviation Authority

Consultation: The Future of Remote Pilot Competency in the Specific Category

Published by the Civil Aviation Authority, 2023

Civil Aviation Authority
Aviation House
Beehive Ringroad
Gatwick Airport South
W Sussex
RH6 0YR

First published July 2023

Contents

Reference Tables **4**
Consultation Structure **5**
Chapter 1 **6**
Introduction **6**
Background 6
Purpose 6
Analysis 6
Conclusion 7
Chapter 2 **8**
RPCWG Workstreams **8**
RPCWG Workstreams 8
Rulemaking to Establish RAEs under an Improved Legal Basis 8
RAE Structure Review 9
Establishing Remote Pilot Medical Standards in the Specific Category 9
The Future Remote Pilot Competency Framework **11**
Introduction 11
The General VLOS Certificate (GVC) 11
The Basic Remote Pilot Certificate (RPC-B) 12
Advanced Remote Pilot Certificate (RPC-A) 13
Complex Operations Training Modules 13
Chapter 3 **14**
Appendix A - The Basic Remote Pilot Certificate **14**
Chapter 4 **21**
Appendix B – The Advanced Remote Pilot Certificate **21**
Chapter 5 **29**
APPENDIX C – Training Task Analysis **29**
Chapter 6 **39**
Remote Pilot Competencies **39**

Reference Tables

Table 1 - RPC-B Theoretical Assessment Topics 15
Table 2 - RPC-B Skills Test Part A 19
Table 3 - RPC-B Skills Test Part B 20
Table 4 - RPC-A Theoretical Assessment Topics 22
Table 5 - RPC-A Skills Test 28
Table 6 - Task Analysis Ground Operations 29
Table 7 - Task Analysis Take Off and Departure 30
Table 8 – Task Analysis Climb Out 31
Table 9 - Task Analysis Cruse 32
Table 10 - Task Analysis Descending 36
Table 11 - Task Analysis Approach 37
Table 12 - Task Analysis Landing 37
Table 13 - Task Analysis Post Flight Actions 37
Table 14 - Application of Knowledge 39
Table 15 - Application of Procedures & Compliance with Regulations 39
Table 16 - Situational Awareness 40
Table 17 - Communication 40
Table 18 - RPA flight path management, automation 40
Table 19 - Leadership, teamwork, and self-management 41
Table 20 - Problem solving and decision making 41
Table 21 - Workload management 42

Consultation Structure

The CAA recognises the impact of restructuring remote pilot competency training on Recognised Assessment Entities (RAEs) and the UK UAS industry. This purpose of this consultation is to gather views from key stakeholder groups including RAEs, Remote Pilots, and Operators early in the policy development process.

Given the length of the document being consulted on the CAA has chosen a mechanism of capturing feedback that allows for the simplest interrogation of the data.

To that end, each line within the consultation document is sequentially numbered. If you identify an area you wish to provide feedback, please include the line number as a reference for each comment that you wish to provide.

CHAPTER 1

Introduction

Background

In July 2022, the Civil Aviation Authority (CAA) formed an internal working group to develop a framework of new remote pilot (RP) competencies for the Specific category. The working group, led by the CAA Remotely Piloted Aircraft System (RPAS) Policy Team, bought together experts from RPAS Policy, RPAS Sector, Airspace, Air Traffic Management and Aerodromes (AAA), and the CAA Medical Teams.

The formation of the RP Competency Working Group (RPCWG) was driven by two primary requirements:

- Review the current RP competency training system to assess its fitness to provide safe UAS operations.
- Establish the future competency requirements needed to enable more complex and scalable UAS operations.

Purpose

The purpose of this document is to share the CAA's thinking on the future of RP competency and receive early feedback from all stakeholders through structured consultation. It is important to consider this document in the context of **future** UAS operations that may not currently routinely be approved by the CAA and not as comparison to the current CAP 722B.

Analysis

The RPCWG carried out a comprehensive analysis of RP competency training both current state and future requirements. Intelligence from the UAS Safety Review Panel, which takes in data from the Air Accidents Investigation Branch (AAIB) and European Co-ordination Center for Accident and Incident Reporting Systems 2 (ECAIRS2), was used to review the current safety risks directly linked to RP competency and training to identify improvement areas.

Analysis of future RP competency requirements considered best practice from numerous sources such as the International Civil Aviation Organisation (ICAO), the Joint Authorities for Rulemaking on Unmanned Systems (JARUS), the European Union Aviation Safety Agency (EASA), the Civil Aviation Safety Agency (CASA), as well as drawing on manned aviation best practise. Where policy did not exist, it was developed in accordance with CAA regulatory principles and peer reviewed by the RPCWG and the wider CAA.

The result of the analysis revealed some focus areas for future development:

- The current General Visual Line of Sight Certificate (GVC) is limited by the VLOS condition and therefore its scope to expand with future needs is also limited
- Any new RP competency training will need to work with UK Specific Operational Risk Assessment (SORA) once it has been implemented
- The complexity of future training will require the current RAE structure to be more adaptable to future needs
- The number of different types of UAS and operations means that it not practical to implement a 'type rating' system. Instead, operators and Original Equipment Manufacturers (OEM) will propose an acceptable level of type specific training during the application for an Operational Authorisation (OA).

Conclusion

After considerable analysis including feedback from RAEs, the RPCWG concluded that the level of required RP competency falls largely into the following operational boundaries:

Visual Line of Sight (VLOS) Operations

Simple Unmanned Aircraft System (UAS) operations that can be undertaken using a basic Pre-Determined Risk Assessment (PDRA) when VLOS is used as the primary method of deconfliction.

Complex VLOS and localised beyond visual line of sight (BVLOS) operations

VLOS operations that are complex and require a higher level of competency, for example, flying close to uninvolved people. Localised BVLOS operations that are not affected by en-route threats such as changing weather or integration with other air users.

BVLOS En-route Operations

BVLOS operations that are complex and are subject to en-route threats such as other traffic, changing weather, changing airspace, and landing at a remote destination.

BVLOS Highly Complex Operations

BVLOS operations as above but require specific additional competencies such as integrating with Instrument Flying Rules (IFR) traffic, multi crew cooperation and operating in and out of licenced aerodromes.

The RPCWG also concluded that the level of operational risk, for example the SORA SAIL, does not always correlate with the required competency. For example, a flight in controlled airspace requires specific competencies, however it is not necessarily higher risk than a flight conducted in uncontrolled airspace.

Therefore, the proposed training framework reflects an operation centric and modular approach.

CHAPTER 2

RPCWG Workstreams

RPCWG Workstreams

The RPCWG project has four main workstreams which are:

- Rulemaking to establish RAEs under an improved legal basis such as the UK Regulation (EU) 2018/1139, the Basic Regulation
- Establishing medical standards for RPs in the specific category
- Developing a framework for the future of RP competency
- Developing the supporting RP competency policy, AMC, and GM

Rulemaking to Establish RAEs under an Improved Legal Basis

RAEs for RP competency are currently established under article 268 of the Air Navigation Order (ANO). In March 2022 the RPAS Policy Team began a rule making task with the Department for Transport (DfT) to define RAEs as specific entities in law. The CAA recommended that RAEs be established under UK Regulation (EU) 2019/947, the Implementing Regulation, (where the majority of UAS regulation now sits).

This will benefit the CAA and RAEs by:

- making the responsibilities of RAEs, when discharging their duty on behalf of the CAA, clear and legally binding
- allowing the CAA to respond to the future needs of industry by establishing third party entities to issue certificates on behalf of the CAA rather than providing reports under the ANO
- for Acceptable Means of Compliance and Guidance Material (AMC & GM) to be developed in a transparent manner, including full public consultation where applicable

In October 2022, the CAA wrote to all RAE's and published the above proposal as a full public consultation the results of which can be found here. We received 10 responses, most of which welcomed the proposed changes. Some respondents requested more explanation of the proposed changes which this document seeks to address.

In December 2022, the RPAS policy team submitted our Opinion and Instruction Document (OID) to the DfT. The DfT and CAA are considering which legal powers are most appropriate for expanding the scope of RAEs and will report out in due course.

RAE Structure Review

Delivery of future RP training by RAEs will be more complex and potentially require more resources. The CAA anticipates that not all RAEs will want to conduct advanced training courses depending on their specific business model. Therefore, the CAA is proposing to introduce two tiers of RAE for RP competency:

- RAE – Basic Competency (BC)
- RAE – Advanced Competency (AC)

BC RAEs will be approved to deliver RP training including the A2CofC, GVC and the Basic Remote Pilot Certificate (RPC-B). The oversight regime for this RAE type will remain largely the same as currently detailed in CAP 722B.

AC RAEs will be approved to deliver all the above courses including advanced RP training. The oversight regime for this type of RAE may be more stringent than for a RAE BC, proportional to the increased safety risk of delivering complex RP training for CAA.

After the CAA and DfT have completed the regulatory review of the legal basis for RAEs, the CAA will publish new AMC &GM for public consultation detailing the above structure, requirements, and process to make an application under the new scheme.

Establishing Remote Pilot Medical Standards in the Specific Category

For the majority of current UAS operations, a declaration of RP fitness to fly is proportionate to the safety risk. Many OA holders have implemented more stringent requirements as part of their safety management system (SMS) which is to be commended. In the future, RPs are likely to be undertaking operations in more complex airspace and over areas of increased ground risk.

The RPCWG engaged with the CAA Medical Team to establish what, if any, medical standard should be applied to more complex operations in the Specific category.

Key aims for the study were:

- Proportionality - To develop medical standards that are proportionate to the risk of UAS operations, reflecting the capabilities these systems have for improved safety over manned aviation. This may include software which defaults to autopilot when user input is removed, collision avoidance and always-on airspace restrictions.
- Longevity – To ensure that UAS medical standards can survive the pace of development in this sector and don’t stifle future growth. Any standard needs to be both justified and reflect technology which can be applied to overcome any loss of capability from illness or injury.

- Cross Certification – To minimise regulatory burden and reflect the safety tolerances of manned aviation, individuals who currently hold Class 1/2/3/LAPL certificates should be able to meet the minimum medical standards for UAS operations

Unmanned aviation presents a unique opportunity to include people with disabilities where that might not be possible in traditional manned aviation. Inclusivity has been considered throughout our work on the medical standards. As well as the human functional elements of flying remotely, other risks such as pilot incapacitation were also assessed as part of this work in the context of the Command Unit (CU).

Based on the research carried out by the CAA Medical Team and reviewed by the RPCWG, the proposal is to use the Light Aircraft Pilots License (LAPL) Medical Certificate minimum standards as a minimum standard to hold the RPC-A competency.

The RPC-B will not require a formal medical certificate and will continue to use the declarative fitness to fly methodology.

The CAA will continue to review this policy particularly in relation to the increasing use of automation which may result in a custom RP medical certificate being developed in the future.

A separate CAP detailing how RPs can take advantage of the LAPL medical certificate system will be published in due course. A supporting CAP will also detail how General Practitioners (GPs) will issue LAPL medical certificates for RPs at the same time.

The Future Remote Pilot Competency Framework

Introduction

The future RP competency framework introduces two core RP competency certificates:

- The Basic Remote Pilot Certificate or RPC-B
- The Advanced Remote Pilot Certificate or RPC-A

Each RP competency will be divided into two variants; aeroplane (A), where the primary source of lift of the aircraft is fixed wings, and rotorcraft (R) where the primary source of lift of the aircraft is rotating wings. These variants allow classification of novel and hybrid UAS for example a fixed wing VTOL.

In addition to these new core certificates, the CAA is proposing to introduce several operation specific training certificates that can be added to the RPC-A as part of a modular approach.

The General VLOS Certificate (GVC)

The GVC was developed to provide an acceptable means of compliance to Article 8 after the introduction of the EU Regulation Package.

RAEs may continue to provide GVC courses if they wish to. The GVC would remain an acceptable competency for PDRA-01 however, it will be not automatically be accepted for any new PDRAs adopted by the CAA, depending on the operational requirements.

The CAA recognises RP and operator investment in training and will introduce a credit system to consider previous training in final RP competency policy.

The CAA is keen to hear feedback on the retaining the GVC as a basic level of VLOS training or phasing it out after the introduction of the new competency framework detailed in this document.

The Basic Remote Pilot Certificate (RPC-B)

Introduction

The RPC-B is designed to train RPs with the competencies to fly more complex operations including BVLOS subject to the operator's operational authorisation.

A revised theorical knowledge assessment has been developed to focus on a broader range of operations than the GVC. The fundamentals of BVLOS flying are also covered to account for potential future PDRA competency requirements.

The most significant difference between the GVC and the RPC-B is the required minimum flight instruction. The proposed minimum requirements are:

- 5 hours of non-Global Positioning System (GPS) assisted flight instruction
- 5 hours of mission-based flight instruction
- 10 hours of GPS assisted flight instruction

The requirement to be competent in non-GPS assisted flying is safety driven. Intelligence from the CAA and AAIB showed that several accidents were caused by a of a lack of RP training in non-GPS assisted flight modes. The CAA has recognised this and as a result is implementing the above requirement for future RPs.

The requirement to be competent in mission-based flying is a result of increased use of automation in routine UAS operations. Most UAS now have a mission based (GPS Waypoint) flying mode. Mission based flying represents a different and important skill for RPs. Competency in mission-based flying will help to prepare RPs for real world operations.

The requirement to complete mandatory GPS assisted flight instruction is designed to improve the overall standard of RP competency. The CAA recognises that RAE practical flight instructors possess a huge amount of valuable experience however, the GVC affords very little time to pass on that knowledge. This requirement will increase knowledge transfer, improve standards, and RP preparedness for PDRA operations.

Privileges and Conditions

The detailed privileges and conditions of the RPC-B can be found in Appendix A

Advanced Remote Pilot Certificate (RPC-A)

Introduction

The RPC-A is designed to prepare RPs for complex UAS operations in the Specific category including BVLOS.

The RPC-A consists of a new extended theorical knowledge assessment criteria and minimum flight instruction requirements. Details of the proposed extended theoretical assessment criteria can be found in Appendix B.

The initial RPC-A minimum flight instruction and assessment criteria have been developed using a task analysis (available in Appendix C) and competency analysis according to established ICAO best practise. A list of recommended competencies is available in (Appendix D).

The delivery of complex UAS training will be challenging requiring sufficient knowledge, resources, and internal oversight procedures.

Privileges and Conditions

The detailed privileges and conditions of the RPC-A can be found in Appendix B

Complex Operations Training Modules

Introduction

As described in Chapter 1, the CAA has identified that the following operations may need specific RP competency training:

- BVLOS in Controlled Airspace
- Arriving and departing from licensed aerodromes
- Complex BVLOS in a multicrew/distributed crew operation
- Flying highly automated UAS
- UA Swarming operations
- Flying multiple simultaneous operations (MSO)

Privileges and Conditions

The CAA is developing the minimum requirements for these modules and proposals will be communicated in the future for consultation.

The CAA is very keen to hear feedback and opinion on the proposed additional modules above as part of bringing forward a detailed structure.

CHAPTER 3

Appendix A - The Basic Remote Pilot Certificate

Note – for the purposes of brevity, aeroplane and rotorcraft subject matter has been combined in this document however, it will be separated in the final policy e.g., RPC-B(A) and RPC-B(R). If you have feedback regarding a specific variant, please mark your response accordingly.

General Conditions and Privileges

Applicants for the issue of an RPC-B shall have fulfilled the requirements of the relevant training course at a CAA approved RAE

The RP shall have completed the following initial training prior to being accepted for further training:

- Open category online training material (AMC1UAS.OPEN.20(4)(b) & UASOPEN.040(3) & UASOPEN.0302(a)
- Open category online assessment, and have obtained a Flyer ID.

Proposed RPC-B Privileges

The privileges of the holders of an RPC-B are to act as RP in command or flight crew of UAS including for renumeration where:

- the flight is being undertaken in the Specific category

and

- a PRDA has been released by the CAA which states that an RPC-B is an acceptable means of competency

or

- has been identified a by the operator as the necessary level of competency as set out in UAS.SPEC.050(1)(d)(i).

Credit for Previous Training

The CAA recognises the previous investment RPs have made in training such as the GVC. However, this needs to be balanced against the future RP competency standards which will enable access to more complex operations.

The CAA is proposing that holders of a valid GVC at the time of entry to training will receive up to a 20% reduction in the GPS flight instruction element of the RPC-B. RAEs will be empowered to exercise judgment as to the individual reduction, for example based on a pre-entry test and on a case-by-case basis.

Currency and Refresher Training

The CAA is planning to introduce a digital record of competency for every registered RP. The system will be administered jointly by the CAA and RAEs.

Holders of an RPC-B will submit currency logs to the CAA on yearly basis. The minimum currency at any time shall be no less than two hours on type within the last 90 days or less depending on the policy of the UAS Operator.

RPC-B will require renewal by an RAE every three years including an assessment for mandatory refresher training. Further details of this will be made available in the future.

The RPC-B Theory Assessment Topics

Theoretical knowledge will be assessed via multiple choice examination with a minimum number of questions per subject area. The aviation standard pass mark of 75% will be used for all examinations.

Table 1 - RPC-B Theoretical Assessment Topics

Item	RPC-B Theoretical Knowledge Topics	
1	Air Law	
	1.1	Demonstrate an understanding of the UK Regulation (EU) 2019/947 with particular attention to articles describing the responsibilities of RPs and UAS Operators
	1.2	Demonstrate an understanding of the Acceptable Means of Compliance to UK Regulation (EU) 2019/947 including relevant CAA supporting publications
	1.3	Demonstrate awareness of the UK Air Navigation Order including residual articles relevant to UAS operations
	1.4	Demonstrate an understanding of the Operational Authorisation (OA) and how it describes the privileges and conditions it sets out
	1.5	Demonstrate an understanding of operational risk management methodologies accepted by the CAA in the UK including: i. PRDAs and their published risk assessments ii. the principles of SORA operating safety cases
2	Airspace Operating Principles	
	2.1	Describe specific airspace classifications and types.
	2.2	Describe the UK airspace reservations such as: i. Danger Areas ii. Restricted Areas iii. Prohibited areas
	2.3	Demonstrate an understanding of official sources of information that support UAS operations
	2.4	Extract information from relevant aeronautical information sources
	2.5	Interpret information from aeronautical information sources for their applicability to UAS operations
3	Airmanship and Aviation Safety	

Item	RPC-B Theoretical Knowledge Topics	
	3.1	Demonstrate an understanding of good RP competency principles and how these principles and situational awareness are linked
	3.2	Demonstrate an awareness of safety management systems (SMS) and the role of the RP in maintaining an SMS
	3.3	Demonstrate an awareness of emergency response plan (ERP) procedures and the role of the RP in maintaining an ERP
	3.4	Demonstrate an awareness of good and bad organisational safety culture including the principles of just culture.
	3.5	Describe the importance of mandatory occurrence, AAIB, airprox and aviation reporting systems and their role in aviation safety
	3.6	Demonstrate the ability to create a mandatory occurrence report (MOR) via the relevant reporting channel
	3.7	Demonstrate an awareness of other reporting types
4	Human Factors	
	4.1	Describe how human performance (and thus flight safety) is affected by: i. fatigue ii. RP fitness to fly
	4.2	Describe limitations humans have in using systems with differing designs of: i. ground station aircraft controls ii. data entry methodologies iii. interpretation of flight and map display information iv. warnings, cautions and routine messages
	4.3	Recognise human behaviours that can both positively and negatively affect the safety of the flight, to include: i. threat and error management (TEM) ii. crew resource management, maintain effective communications situational awareness iii. decision making iv. automation induced complacency
5	Meteorology	
	5.1	Demonstrate ability to obtain, interpret and apply meteorological reports and forecasts for operations
	5.2	Describe potentially adverse weather conditions and their effects on the UA
	5.3	Demonstrate an understanding of meteorological terminology such as units of measurement
6	Instruments, Navigation and Communication	
	6.1	Explain the principles of operation and performance limitations of GPS
	6.2	Describe GPS errors and the source of these errors
	6.3	Explain the need and process for GPS integrity and continuity checking
	6.4	**Reserved for future**
	6.5	Demonstrate an understanding of the flight instruments on an UAS
	6.6	Describe how the following UAS systems work: i. UAS automation ii. altimetry instruments and their limitations iii. C2 link technologies iv. geo-awareness and its limitations v. aeronautical communications

Item	RPC-B Theoretical Knowledge Topics	
		vi. surveillance equipment/technologies vii. instruments, telemetry, and display systems
	6.7	Describe the effects of: i. distance and obstacles between the transmitter and receiver on the quality of the C2 link ii. electromagnetic interference from various sources on the strength and quality of the C2 link signal iii. environmental factors such as weather, dust, precipitation, and cloud on system performance
	6.8	Describe the rules applicable to UAS regarding operating at or near aerodromes, aircraft landing areas and helicopter landing sites
	6.9	Determine if a flight may proceed based on route, aircraft equipment, power/fuel available and equipment
7	UAS Technical Knowledge	
	7.1	Describe the basic principles of flight for aeroplanes and rotorcraft
	7.2	Describe the operating principles of common UAS propulsion systems
	7.3	Demonstrate an awareness of common onboard navigation system sensors and their performance limitations including: i. Compass ii. Inertial Measurement Unit (IMU) iii. Barometer iv. Pitot Tube v. Antenna vi. GPS Receiver vii. DAA
	7.4	Demonstrate an awareness of common command and control link systems and their performance limitations
	7.5	Demonstrate an awareness of C2 link frequency and spectrum licencing including the role of OFCOM in issuing such licences
	7.6	Demonstrate an awareness of aircraft technical logs
	7.7	Demonstrate the ability to locate, retrieve and interpret aircraft technical logs prior to conducting flight operations
	7.8	Demonstrate an awareness of aircraft minimum UA functional requirements for go no-go decision making
	7.9	Demonstrate the ability to calculate aircraft mass and balance based on manufacturer data
	7.10	Demonstrate an understanding of battery handling procedures
	7.11	Demonstrate an understanding of high-voltage aircraft system safety procedures
8	Aviation Security	
	8.1	Describe the responsibilities of the RP relating to the security of UAS operations
	8.2	Describe the security threats and mitigations that a RP may encounter when flying including: i. Cyber threats ii. Physical threats
	8.3	Demonstrate an awareness of the relevant UK privacy regulations and the General Data Protection Regulation

304

Practical Flight Assessment

General

An applicant for a skill test for the RPC-B shall have received instruction on the same class or type of UAS to be used in the test.

An applicant shall pass all the relevant sections of the skill test. If any item in a section is failed, that section is failed. Failure in more than one section will require the applicant to take the entire test again. An applicant failing only in one section shall only repeat the failed section. Failure in any section of the retest, including those sections that have been passed on a previous attempt, will require the applicant to take the entire test again. All relevant sections of the skill test shall be completed within 6 months. Failure to achieve a pass in all relevant sections of the test in two attempts will require further training.

Further training may be required following any failed skill test. There is no limit to the number of skill tests that may be attempted.

Conduct of the test

Should the applicant choose to terminate a skill test for reasons considered inadequate by the Flight Examiner (FE), the applicant shall retake the entire skill test. If the test is terminated for reasons considered adequate by the FE, only those sections not completed shall be tested in a further flight.

At the discretion of the FE, any manoeuvre or procedure of the test may be repeated once by the applicant. The FE may stop the test at any stage if it is considered that the applicant's demonstration of flying skills requires a complete re-test.

An applicant shall indicate to the FE the checks and duties carried out. Checks shall be completed in accordance with the checklist for the aircraft on which the test is being taken. During pre-flight preparation for the test, the applicant will configure the (CU).

The FE shall take no part in the operation of the aircraft except where intervention is necessary in the interests of safety.

Content of the skill test for the issue of an RPC-B

The UAS used for the skills test shall meet the requirements for training UAS as set out in the relevant CAA publication.

The skills test shall comprise of two parts and shall be carried out as real-world practical flying:

Part A, a general handling examination in a range of flight modes including non-positioning mode lasting a minimum of 30 minutes

and

Part B a waypoint mission-based examination including a flight segment where the UAS is to be flown beyond visual line of sight (BVLOS).

RPC-B PART A

Use of checklists, situational awareness, control of the aeroplane/rotorcraft either manually or by use of the CU, and principles of risk management apply to all sections.

Table 2 - RPC-B Skills Test Part A

Skill test for the issue of an RPC-B Part A A = Required for Aeroplanes | R = Required for Rotorcraft		A	R
Section – 1 Pre Flight			
1.1	Conducts a pre-flight, including flight planning, documentation, mass and balance consideration, flight briefing, NOTAMS	●	●
1.2	Aeroplane/rotorcraft inspection and servicing	●	●
1.3	Take-off	●	●
1.4	Take-off uneven ground		●
1.5	Performance considerations	●	●
Section – 2 General Handling			
2.1	Control of the aeroplane/rotorcraft by use of the CU on both positioning and non-positioning flight modes including: 1) level flight, control of heading, altitude, and airspeed 2) climbing and descending turns 3) recoveries from unusual attitudes	●	●
2.2	Flight at critically low airspeeds including recognition of and recovery from stalls	●	
2.3	Turns, including turns in landing configuration. Steep turns 45°	●	
2.4	Flight at critically high airspeeds	●	
2.5	Hover Manoeuvres (if applicable)		●
2.6	Autorotation (if equipped)		●
Section – 3 Approach and Landing			
4.1	Approach procedures	●	●
4.3	Go-around action from low height	●	●
4.4	Normal Landing	●	●
4.5	Post flight actions	●	●
Section - 4 Abnormal and Emergency Procedures			
5.1	Simulated engine failure	●	●
5.2	Equipment malfunctions	●	●
5.3	Forced landing (simulated)	●	●
5.4	Oral questions	●	●

RPC-B PART B

Use of checklists, situational awareness, control of the aeroplane/rotorcraft either manually or by use of the CU, and principles of risk management apply to all sections.

Table 3 - RPC-B Skills Test Part B

Skill test for the issue of an RPC-B Part B A = Required for Aeroplanes | R = Required for Rotorcraft		A	R
Section – 1 Pre Flight Operations			
1.1	Conducts a pre-flight, including Flight planning, Documentation, Mass and balance consideration, flight brief, NOTAMS	●	●
1.2	Configures the CU	●	●
1.3	Aeroplane/rotorcraft inspection and servicing	●	●
1.4	Take-off	●	●
1.5	Performance considerations	●	●
Section – 2 Infight procedures			
2.1	Control of aeroplane/rotorcraft by the CU, including mission configuration and range/endurance considerations	●	●
2.2	Monitoring of flight progress, fuel/energy usage, airspace, and ground risks	●	●
2.3	Altitude, speed, heading control	●	●
2.4	Monitoring navigation and communication system performance	●	●
2.5	CU management	●	●
Section – 3 Approach and Landing			
4.1	Approach procedures	●	●
4.3	Go-around action from low height	●	●
4.4	Normal Landing	●	●
4.5	Post flight actions	●	●
Section – 4 Abnormal and Contingency Procedures			
5.1	Simulated engine failure	●	●
5.2	Equipment malfunctions	●	●
5.3	Forced landing (simulated)	●	●
5.4	Oral questions	●	●

CHAPTER 4

Appendix B – The Advanced Remote Pilot Certificate

Note – for the purposes of brevity, aeroplane and rotorcraft subject matter has been combined in this document however it will be separated in the final policy e.g. RPC-A(A) and RPC-A(R). If you have feedback regarding a specific variant, please mark your response accordingly.

Minimum age

Applicants for an RPC-A shall be at least 18 years old

General Conditions and Privileges

Applicants for the issue of an RPC-A shall have fulfilled the requirements of the relevant training course at a CAA approved RAE

Training course

Applicants for an RPC-A shall complete a practical training course at an RAE

The course shall include theoretical knowledge and flight instruction appropriate to the privileges of the RPC-A Certificate

Theoretical knowledge instruction and flight instruction may be completed at a RAE different to the one where applicants have commenced their training

Remote Pilot Certificate RPC-A

Entry to training

Before being accepted for training an applicant should be informed that the appropriate medical certificate must be obtained.

The RP shall have completed the following initial training prior to being accepted for further training:

- Open category online training material (AMC1UAS.OPEN.20(4)(b) & UASOPEN.040(3) & UASOPEN.0302(a)
- Open category online assessment, and have obtained a Flyer ID.

Privileges

The privileges of the holders of an RPC-A are to act as RP in command or flight crew of a UA including for renumeration where:

- the flight is being undertaken in the Specific Category

and

- a pre-defined risk assessment PRDA has been released by the CAA which states that an RPC-A(A) is an acceptable means of competency

or

- has been identified a by the operator as the necessary level of competency as set out in UAS.SPEC.050(1)(d)(i).

Conditions

Applicants for the RPC-A shall hold the minimum of a LAPL Medical Certificate.

Applicants for the RPC-A shall hold an Advanced UAS Theoretical Certificate.

RPC-A Experience requirements and crediting

Applicants for the RPC-A(A) shall have completed at least 55 hours of flight instruction using an UAS suitable for complex operations, 35 of which may be completed using a CAA approved Flight Simulator Device including at least:

- 35 hours of beyond visual line of sight dual flight simulator instruction; and
- 15 hours of beyond visual line of sight dual practical flight instruction; and
- 5 hours practical flight as RP In Command

Crediting. Applicants with prior experience as a licenced manned aviation pilot or military pilot may be credited towards the requirements above.

The amount of credit shall be decided by the RAE where the pilot undergoes the training course, based on a pre-entry flight test, but shall in any case not exceed 10% of the total hours required.

The CAA will publish sperate guidance on the use of flight simulator devices for RP training in due course.

Theoretical Assessment Topics

Theoretical knowledge will be assessed via multiple choice examination with a minimum number of questions per subject area. The aviation standard pass mark of 75% will be used for all examinations.

Note – the CAA may introduce per subject assessments for safety critical topics.

Table 4 - RPC-A Theoretical Assessment Topics

Item	RPC-A Theoretical Assessment Topics	
1	Air Law	
	1.1	Demonstrate an understanding of the UK Regulation (EU) 2019/947 with particular attention to articles describing the responsibilities of RPs and operators
	1.2	Demonstrate an understanding of the Acceptable Means of Compliance to UK Regulation (EU) 2019/947 including relevant CAA supporting publications

Item	RPC-A Theoretical Assessment Topics	
	1.3	Demonstrate awareness of the UK Air Navigation Order including residual articles relevant to UAS operations
	1.4	Demonstrate awareness of international aviation law relevant to manned and unmanned aviation for example ICAO SARPs and other relevant international conventions such as SERA
	1.5	Describe the privileges and conditions of the Advanced Remote Pilot Competency certificate and published operation specific training modules
	1.6	Describe the currency and recurrency requirements of the Advanced Remote Pilot Competency certificate and published operation specific training modules
	1.7	Demonstrate an understanding of the operational authorisation (OA) and how it describes the privileges and conditions it sets out
	1.8	Demonstrate an understanding of operational risk management methodologies accepted by the CAA in the UK including i. PRDAs and their published risk assessment ii. the principles of SORA iii. operating safety cases
2	Airspace Operating Principles	
	2.1	Describe the UK airspace construct including Flight Information Regions and airspace classifications
	2.2	Describe specific airspace types such as Flight Restriction Zones (FRZ) and other controlled airspace zones
	2.3	Describe the UK airspace reservations such as i. Danger Areas ii. Restricted Areas iii. Prohibited areas
	2.4	Demonstrate an understanding of official sources of information that support UAS operations
	2.5	Extract information from relevant aeronautical information sources
	2.6	Interpret information from aeronautical information sources for their applicability to UAS operations
3	Airmanship and Aviation Safety	
	3.1	Demonstrate an understanding of good RP competency principles and how these principles and situational awareness are linked
	3.2	Demonstrate an awareness of safety management systems (SMS) and the role of the RP in maintaining an SMS
	3.3	Demonstrate an awareness of emergency response plan procedures and the role of the RP in maintaining an ERP
	3.4	Demonstrate an awareness of good and bad organisational safety culture including the principles of just culture
	3.5	Describe the importance of mandatory occurrence reporting
	3.6	Demonstrate the ability to create an MOR via the relevant reporting channel
	3.7	Demonstrate an awareness of other reporting types such as Airprox and CHIRP
4	Human Factors	
	4.1	Demonstrate an awareness of the medical standards for each RP competency certificate available for specific category UAS operations
	4.2	Describe limitations humans have in using systems with differing designs of: i. CU and aircraft controls ii. data entry methodologies iii. interpretation of flight and map display information iv. warnings, cautions and routine messages
	4.3	Describe how human performance (and thus flight safety) is affected by: i. fatigue

Item	RPC-A Theoretical Assessment Topics	
		ii. monotonous monitoring of the UAS
	4.4	Recognise human behaviours that can both positively and negatively affect the safety of the flight, to include: i. threat and error management (TEM) ii. crew resource management, maintain effective communications iii. situational awareness iv. decision making v. automation induced complacency
	4.5	Demonstrate an awareness of the principles of crew resource management when both co-located with other crew members and remote from other crew members
	4.6	Demonstrate an awareness of multi-crew cooperation procedures and best practices
5	Meteorology	
	5.1	Demonstrate awareness of how meteorological conditions affect manned aviation for both visual flight rules (VFR) and instrument flight rules (IFR) operations and how this may increase UAS operation threats and errors
	5.2	Demonstrate ability to obtain, interpret and apply meteorological reports and forecasts for operations when both co-located with the pilot and remote from the pilot
	5.3	Demonstrate awareness of how weather patterns and surface pressure can change over distance and how this will affect the BVLOS operations
	5.4	Describe adverse weather conditions and their effects on the UA
	5.5	Describe flying conditions and the dangers of airframe icing, hail, microbursts, wind shear, turbulence enroute, when experienced in conjunction with certain cloud types, precipitation, temperature, wind, and wake turbulence.
	5.6	Demonstrate an understanding of meteorological terminology such as units of measurement
6	Instruments, Navigation and Communication	
	6.1	Explain the principles of operation and performance limitations of GPS
	6.2	Describe GPS errors and the source of these errors
	6.3	Explain the need and process for GPS integrity and continuity checking
	6.4	**Reserved for future**
	6.5	Demonstrate an understanding of the flight instruments on a CU
	6.6	Demonstrate an understanding of navigation equipment that should be installed and serviceable for conducting a BVLOS flight.
	6.7	Describe how the following UAS systems work: i. UA automation ii. altimetry instruments and their limitations iii. C2 link technologies iv. geo-awareness and its limitations v. aeronautical communications vi. surveillance equipment/technologies vii. instruments, telemetry, and display systems
	6.8	Describe the effects of: i. distance and obstacles between the transmitter and receiver on the quality of the C2 link ii. electromagnetic interference from various sources on the strength and quality of the C2 link signal iii. environmental factors such as weather, dust, volcanic ash, precipitation, and cloud on system performance

Item	RPC-A Theoretical Assessment Topics	
	6.9	Demonstrate an understanding of tools for situational awareness and monitoring UA flight paths for the purpose of deconfliction
	6.10	Demonstrate an understanding of enroute navigation, including navigation to prevent loss of situational awareness of UA location
	6.11	State the rules applicable to UA regarding operating at or near aerodromes, aircraft landing areas and helicopter landing sites
	6.12	Determine if a flight may proceed based on route, aircraft equipment, power/fuel available and equipment
	6.13	Explain how Minimum Safe Altitude (MSA) affects manned aircraft planning and operations for the purpose of deconflicting between manned and remotely piloted aircraft
	6.14	Describe strategic planning methods to deconflict remotely UAS from other traffic, terrain, and obstacles
	6.15	Identify local, area and aerodrome pressure settings l (QNH/QFE) and the standard pressure setting for the purposes of deconflicting vertically against other traffic
	6.16	Demonstrate ability to plan for operations in proximity to prohibited, restricted and danger areas
	6.17	Demonstrate ability to plan for operations in proximity to ground risk classes higher than approved for the current operation
	6.18	Demonstrate ability to plan for operations in proximity to air risk classes higher than approved for the current operation
	6.19	Demonstrate an understanding of aerodrome visual joining and departure procedures for manned aircraft
	6.20	Demonstrate an understanding of aerodrome instrument approach and departure procedures for manned aircraft
	6.21	Demonstrate an understanding of rules relating direction of travel to manned aircraft height and altitudes for the purpose of deconflicting between manned and remotely piloted aircraft
	6.22	Describe methods of identifying and subsequently avoiding threats from wildlife.
	6.23	Describe the considerations a RP should identify for each of the following components of a flight profile for day and night operations in controlled and uncontrolled airspace and their respective aerodromes: i. take-off and departure ii. climb iii. en-route iv. circuit procedures including aircraft of different performance v. descent and arrival vi. taxi and airport ground operations
	6.24	Demonstrate knowledge of procedures for deconfliction from a manned aircraft suffering abnormal operations and/or emergencies in controlled and uncontrolled airspace and the respective aerodrome procedures
7	UAS Technical Knowledge	
	7.1	Describe the basic principles of flight for aeroplanes and rotorcraft
	7.2	Describe the operating principles of common UAS propulsion systems which shall include: i. Electric motors ii. Internal Combustion Engines iii. Gas Turbine Engines iv. Relevant hybrid and novel systems
	7.3	Demonstrate an awareness of common onboard navigation system sensors and their performance limitations which shall include:

Item	RPC-A Theoretical Assessment Topics	
		i. Compass ii. IMU iii. Barometer iv. Pitot Tube v. Antenna vi. GPS Receiver vii. DAA
	7.4	Demonstrate an awareness of common command and control link systems and their performance limitations which shall include: i. Radio ii. Satellite iii. Cellular Network
	7.5	Demonstrate an awareness of common electronic conspicuity systems and their performance limitations which shall include: i. ADS-B ii. FLARM iii. Pilot Aware iv. Other relevant technologies
	7.6	Demonstrate an awareness of C2 link frequency and spectrum licencing including the role of OFCOM in issuing such licences
	7.7	Demonstrate an awareness of airborne VHF radio systems and licencing including the role of OFCOM in issuing such licences
	7.8	Demonstrate an awareness of aircraft technical logs
	7.9	Demonstrate the ability to locate, retrieve and interpret aircraft technical logs prior to conducting flight operations
	7.10	Demonstrate an awareness of aircraft minimum equipment lists
	7.11	Demonstrate the ability to calculate aircraft mass and balance based on manufacturer data
	7.12	Demonstrate an understanding of battery handling procedures
	7.13	Demonstrate an understanding of high-voltage aircraft system safety procedures
	7.14	Demonstrate and understanding of aviation fuel handling procedures and relevant health and safety legislation such a COSHH
8	Aviation Security	
	8.1	Describe the responsibilities of the RP relating to the security of UAS operations
	8.2	Describe the security threats and mitigations that a RP may encounter when flying including: i. Cyber threats ii. Physical threats
	8.3	Demonstrate an awareness of the relevant carriage of dangerous goods regulations
	8.4	Demonstrate an awareness of the relevant UK privacy regulations and GDPR

Practical Flight Assessment RPC-A

General

An applicant for a skill test for the RPC-A shall have received instruction on the same class or type of UAS to be used in the test.

An applicant shall pass all the relevant sections of the skill test. If any item in a section is failed, that section is failed. Failure in more than one section will require the applicant to take the entire test again. An applicant failing only in one section shall only repeat the failed section. Failure in any section of the retest, including those sections that have been passed on a previous attempt, will require the applicant to take the entire test again. All relevant sections of the skill test shall be completed within 6 months. Failure to achieve a pass in all relevant sections of the test in two attempts will require further training.

Further training may be required following any failed skill test. There is no limit to the number of skill tests that may be attempted.

Conduct of the test

Should the applicant choose to terminate a skill test for reasons considered inadequate by the Flight Examiner (FE), the applicant shall retake the entire skill test. If the test is terminated for reasons considered adequate by the FE, only those sections not completed shall be tested in a further flight.

At the discretion of the FE, any manoeuvre or procedure of the test may be repeated once by the applicant. The FE may stop the test at any stage if it is considered that the applicant’s demonstration of flying skills requires a complete re-test.

Checks shall be completed in accordance with the checklist for the aircraft on which the test is being taken. During pre-flight preparation for the test, the applicant will configure the CU.

The FE shall take no part in the operation of the aircraft except where intervention is necessary in the interests of safety, to avoid unacceptable delay to other traffic, or to avoid a collision.

Content of the skill test for the issue of an RPC-A

The UAS used for the skill test shall meet the requirements for training UAS as set out in the relevant CAA publication.

The route to be flown shall be chosen by the FE and the destination shall be an uncontrolled aerodrome, private landing site, or final approach and take-off area (FATO). After landing at the remote location, the applicant shall arrange the aircraft turn around, depart, and return to the initial take-off location. The applicant shall be responsible for the flight planning and shall ensure that all equipment and documentation for the execution of the flight are correctly completed. The total of both legs of the flight test shall be no less than 60 minutes.

462 Use of the aeroplane/rotorcraft checklists, control of the aeroplane/rotorcraft by use of the
463 CU, and principles of threat and error management apply in all sections. The control of the
464 UA and situational awareness will not be in doubt throughout the test exercises.

465 **Table 5 - RPC-A Skills Test**

Skill test for the issue of an RPC-A A = Required for Aeroplanes | R = Required for Rotorcraft		A	R
Section – 1 Pre Flight Operations and Departure			
1.1	Conducts a pre-flight, including Flight planning, Documentation, Mass and balance consideration, flight brief, NOTAMS	●	●
1.2	Aeroplane/rotorcraft inspection and servicing	●	●
1.3	Taxiing and take-off	●	
1.4	Hover taxi and take-off		●
1.5	Hover Manoeuvres using the CU to position the aircraft		●
1.6	Performance considerations	●	●
1.7	FATO or aerodrome traffic pattern operations	●	●
1.8	Departure procedure, CU configuration, collision avoidance	●	●
1.9	ATC liaison – compliance, R/T procedures	●	●
Section – 2 General Handling			
2.1	Control of the aeroplane/rotorcraft by use of the CU including: 1) level flight at various speeds and configurations 2) climbing and descending turns 3) recoveries from unusual attitudes 4) limited CU panel	●	●
2.2	Flight at critically low airspeeds including recognition of and recovery from stalls	●	
2.3	Turns, including turns in landing configuration. Steep turns 45°	●	
2.4	Turns using up to 30°bank through 180° & 360° left and right		●
2.5	Flight at critically high airspeeds	●	●
2.6	ATC liaison – compliance, R/T procedures	●	●
Section – 3 En-Route Procedures			
3.1	Control of aeroplane/rotorcraft by the CU, including cruise configuration and range/endurance considerations	●	●
3.2	Monitoring of flight progress, flight log, fuel/energy usage, airspace, and ground risk	●	●
3.3	Altitude, speed, heading control	●	●
3.4	Observation and interpretation of weather data, assessment of trends, diversion planning	●	●
3.5	Monitoring navigation and communication system performance	●	●
Section – 4 Approach and Landing			
4.1	Arrival procedures, altimeter setting, use of checklists	●	●
4.2	ATC liaison - compliance, R/T procedures	●	●
4.3	Go-around action from low height	●	●
4.4	Normal Landing	●	●
4.5	Post flight actions	●	●
Section -5 Abnormal and Emergency Procedures			
5.1	Simulated engine failure after take-off (at a safe altitude), fire drill	●	●
5.2	Equipment malfunctions	●	●
5.3	Forced landing (simulated)	●	
5.4	Autorotation (if applicable)		●
5.5	ATC liaison - compliance, R/T procedures	●	●
5.6	Oral questions	●	●

CHAPTER 5

APPENDIX C – Training Task Analysis

During the development of the RPC-A the CAA conducted a broad RP task analysis in accordance with ICAO PANS-TRG Doc 9868. This analysis was used to inform our **initial position** in relation to minimum instruction hours, knowledge, skills, and attitudes (KSAs), and flight test assessment standards.

The CAA have taken the decision to publish the task analysis and performance statements to foster transparency in our analysis process. **Furthermore, the CAA are keen to hear feedback on the completeness of our analysis based on real world operations.**

After the consultation has concluded the CAA will carry further task analyses capturing industry feedback for individual training as required.

Table 6 - Task Analysis Ground Operations

Flight Phase – Ground Operations A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Primary Task - Dispatch Duties		
Subtasks:		
Verifies the technical condition of the aircraft including MEL where applicable	●	●
Checks technical bulletins and notices	●	●
Determines the impact of weather on aircraft performance	●	●
Applies flight planning and loading procedures	●	●
Prepares the flight plan in accordance with operational authorisation	●	●
Primary Task - Fuel/Energy Planning		
Subtasks:		
Determines fuel/energy required for trip in accordance with procedures	●	●
Ensures fuel/energy allowance is sufficient for operational requirements given the conditions and factors on the day	●	●
Primary Task - Refuelling		
Subtasks:		
Ensures aircraft is safe to be refuelled	●	●
Handles high voltage batteries in accordance with SOPs	●	●
Ensures that high voltage batteries are secured in accordance with SOPs	●	●
Ensures that fuel is of correct grade and free from contamination	●	●
Ensures that fuel caps are closed and secured after refuelling	●	●
Primary Task – CU Preparation		
Subtasks:		
Completes all checklist items	●	●
Completes setup procedure in accordance with SOP	●	●
Liaises efficiently with all personnel	●	●
Ensures flightworthiness of the aircraft	●	●
Checks take off performance is within operating range	●	●
Primary Task - Start and After Start Procedures	●	●
Subtasks:		

Flight Phase – Ground Operations A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Asks for, receives, acknowledges, and checks ATC clearance	●	●
Completes engine start and after start procedures	●	●
Uses standard communication procedures with ground crew and ATC	●	●
Primary Task - Flight Briefing		
Subtasks:		
Prepares and delivers standard briefing before flight	●	●
Conducts a take-off/emergency briefing	●	●
Conducts a third-party safety briefing	●	●
Primary Task - Taxi		
Subtasks:		
Completes all recommended taxiing checks and procedures	●	●
Complies with aerodrome/FATO markings and signals	●	●
Controls the aircraft/rotorcraft with appropriate usage of the CU	●	●
Follows ATC instructions	●	●
Completes all departure checks and drills	●	●
Obtains ATC departure clearance	●	●
Confirms aircraft performance criteria	●	●
Uses situational awareness tools to avoid ground conflict	●	●
Primary Task - Pre-Take Off Procedures		
Subtasks:		
Performs approved pre-take off checklist	●	●
Requests and complies with ATC clearance or broadcast intensions	●	●
Check approach and runway/FATO are clear	●	●
Configures aircraft for take-off in accordance with appropriate SOP	●	●
Aligns aircraft with runway or FATO	●	●
Performs approved line up checks	●	●
Checks weather on departure route	●	●
Check runway/FATO status and wind	●	●

479

480 **Table 7 - Task Analysis Take Off and Departure**

Flight Phase – Take Off and Departure A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Primary Task - Take Off		
Subtasks:		
Initiates take off procedure using the CU	●	●
Confirms the propulsion system is within operating limits	●	●
Performs take off procedure in accordance with relevant SOP	●	●
Maintains situational awareness in relation to obstacle clearance	●	●
Ensure safe climb and departure adjusting aircraft configuration as appropriate	●	●
Completes all necessary after take-off checks	●	●
Rejects the take-off for abnormalities prior to reaching take off safety speed	●	●
Primary Task - Crosswind Take Off		
Subtasks:		
Calculates crosswind component for departure runway/FATO	●	●
Initiates take off procedure using the CU	●	●
Confirms the propulsion system is within operating limits	●	●
Performs take off procedure in accordance with relevant SOP	●	●
Maintains situational awareness in relation to obstacle clearance	●	●

Flight Phase – Take Off and Departure A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Ensure safe climb and departure adjusting aircraft configuration as appropriate	●	●
Completes all necessary after take-off checks	●	●
Rejects the take-off for abnormalities prior to reaching take off safety speed	●	●
Primary Task – Automation Management		
Subtasks:		
Maintains a constant awareness of the aircraft's automation state	●	●
Manages automation to achieve optimum trajectory and minimum workload	●	●
Takes effective recovery and actions from automation anomalies	●	●
Operates the aircraft in its various automatic modes	●	●
Monitors the Flight Mode Annunciators and flight path	●	●
Primary Task – Propulsion Failure after Take Off		
Subtasks:		
Performs immediate actions in accordance with QRH	●	●
Follows the prescribed engine out profile as detailed in the applicable SOP Manual	●	●
Advises ATC or any agency capable of aiding, of situation and intensions	●	●
Lands aircraft ensuring safest outcome	●	●
Primary Task – Aborted Take-off		
Subtasks:	●	●
Understands what fault would cause an aborted take-off	●	●
Performs an emergency briefing prior to take-off	●	●
Performs the aborted take-off procedure in accordance with SOPs	●	●
Communicates with ATC and other crew members	●	●
Conducts post aborted take-off actions	●	●

481

482 **Table 8 – Task Analysis Climb Out**

Flight Phase – Climb Out A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Primary Task – Climbing		
Subtasks:		
Configures the RP station appropriately for desired climb performance demonstrating knowledge of best angle, best rate, and cruise climb	●	●
Sets altimeter in accordance with procedures specified in the appropriate SOP manual and regulatory requirements	●	●
Identifies and avoids terrain and traffic threats	●	●
Anticipates the expected level off altitude and monitors the aircraft effectively	●	●
Maintains and monitors heading	●	●
Monitors and reacts appropriately to engine indications and performance	●	●
Adjusts flight profile for weather en-route	●	●
Primary Task – Climbing Turns		
Subtasks:		
Performs pre-turn situational awareness procedures according to SOPs	●	●
Uses appropriate RP station turn mode	●	●
Turns aircraft at various rates depending on the required turn performance	●	●
Monitors engine performance	●	●
Primary Task – Aerodrome/FATO departure		
Subtasks:		
Uses charts or other published information as required	●	●

Flight Phase – Climb Out A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Executes a safe departure in accordance with published information	●	●
Uses ground situational awareness tools appropriately	●	●
Observes the rules of the air and ATC regulations	●	●
Uses correct R/T phraseology	●	●
Maintains directional control	●	●
Follows approved flight routing considering ground risk and air risk characteristics	●	●
Completes all necessary climb checks	●	●
Demonstrates terrain awareness	●	●
Completes departure from the circuit/FATO without incident	●	●
Primary Task - Standard Instrument Departure Procedures		
Subtasks:		
Uses charts, CU displayed data, or other published information as required	●	●
Executes a safe departure in accordance with published information	●	●
Uses ground situational awareness tools appropriately	●	●
Observes the rules of the air and ATC regulations	●	●
Uses correct R/T phraseology	●	●
Maintains directional control	●	●
Follows approved flight routing considering ground risk and air risk characteristics	●	●
Completes all necessary climb checks	●	●
Demonstrates terrain awareness	●	●
Completes departure from the circuit/FATO without incident	●	●

483

484 **Table 9 - Task Analysis Cruse**

Flight Phase - Cruise A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Primary Task - Straight and Level		
Subtasks:		
Sets and maintains throttle/speed appropriately for desired flight performance	●	●
Maintains altitude within the approved operational tolerance	●	●
Maintains heading within the approved operational tolerance	●	●
Primary Task – CU Planned Turns		
Subtasks:		
Monitors CU when approaching planned turn	●	●
Uses effective CU scan technique	●	●
Communicates turn progress with flight crew members using standard phraseology	●	●
Verifies new heading is as expected	●	●
Maintains situational awareness throughout the turn	●	●
Primary Task – Unplanned Turns		
Subtasks:		
Selects the appropriate CU mode for the manoeuvre	●	●
Programs the CU accurately and efficiently	●	●
Verifies the turn is within the aircraft performance envelope	●	●
Executes the instruction correctly	●	●
Verifies the flight path has been updated as expected	●	●
Verifies new heading is as expected	●	●
Maintains situational awareness throughout the turn	●	●

Flight Phase - Cruise A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Communicates turn progress with flight crew members using standard phraseology	●	●
Primary Task – Missed Turn		
Subtasks:		
Recognises missed turn quickly and takes appropriate action	●	●
Selects appropriate CU mode to maintain control	●	●
Uses CU effectively to re-establish on correct heading	●	●
Updates the CU route to correct for resulting deviation	●	●
Verifies the flight path has been updated as expected	●	●
Verifies new heading is as expected	●	●
Maintains situational awareness throughout the turn	●	●
Communicates turn progress with flight crew members using standard phraseology	●	●
Primary Task – Stalling		
Subtasks:		
Performs pre manoeuvre checks	●	
Recognise and recover from various stalls	●	
Recognises visual and aural stall warning devices while approaching the stall	●	
Recovers from stall with minimum loss of altitude	●	
Adjusts aircraft attitude and power setting to resume normal balanced flight on advent of stall.	●	
Primary Task – Practised Forced Landing		
Subtasks:		
Maintains control of the aircraft	●	●
Selects landing area within gliding distance	●	●
Uses all available situational awareness tools to identify areas of low ground risk	●	●
Performs immediate actions in accordance with QRH	●	●
Makes decision to land immediately as soon as it becomes apparent	●	●
Demonstrates planning, workload management, and communication skills during emergency in accordance with procedures	●	●
Performs emergency checks in accordance with QRH	●	●
Advises ATC or any agency that can aid of the situation and intensions	●	●
Uses CU to manoeuvre the aircraft to landing area	●	●
Lands the aircraft ensuring safest outcome if an engine restart is not possible	●	●
Primary Task – Maintenance of Altitude, Heading, and Speed Using the CU		
Subtasks:		
Uses the CU to maintain planned altitude, heading and speed	●	●
Always maintains situational awareness	●	●
Demonstrates awareness of concentration fatigue	●	●
Primary Task – Navigation Procedures		
Subtasks:		
Completes all elements of flight planning for the route prescribed with reference to planned altitudes, and safe levels of operation	●	●
Demonstrates a thorough understanding of the approved operational volume during the flight	●	●
Primary Task – Managing Fuel/Energy		
Subtasks:		
Manage aircraft fuel/energy state and take appropriate action	●	●
Operates fuel/energy system in accordance with SOP	●	●

Flight Phase - Cruise A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Primary Task – Comply with Airspace Requirements		
Subtasks:		
Explains geographical limits of the approved flight area	●	●
Explains the dimensions of the operational volume including flight geography and contingency volume	●	●
Explains air risk buffer and adject airspace principles	●	●
Determines the position of controlled airspace using a chart	●	●
Identifies and avoids restricted airspace using a chart	●	●
Primary Task – Traffic Awareness		
Subtasks:		
Uses situational awareness tools effectively	●	●
Maintains radio listening and interprets transmissions to determine traffic location and intensions of traffic	●	●
Primary Task – Single Crew Operations		
Subtasks:		
Uses checklist in appropriate manner	●	●
Makes configuration changes in accidence with SOP	●	●
Communicates effectively with training staff, crew members and other personnel	●	●
Demonstrates good single crew CRM	●	●
Primary Task – Multi Crew Operations		
Subtasks:		
Uses checklist in appropriate manner	●	●
Makes configuration changes in accordance with SOP	●	●
Communicates effectively with training staff, crew members and other personnel	●	●
Demonstrates good multi crew CRM	●	●
Primary Task – Diversion		
Subtasks:		
Calculates heading, groundspeed, ET A and fuel required during any unscheduled diversion.	●	●
Calculates Safety Altitude for track to new destination.	●	●
Maintains the heading, height and speed	●	●
Primary Task – Monitor Navigation Accuracy		
Subtasks:		
Demonstrates adequate area/route knowledge	●	●
Navigates according to CU flight plan and clearance	●	●
Adjusts flight to weather and traffic conditions	●	●
Communicates and coordinates with ATC	●	●
Primary Task – Monitors GPS Navigation System		
Subtasks:		
Determines if aircraft is within rated coverage of station.	●	●
Enters and checks waypoint entry in GPS system.	●	●
Verifies the integrity of GPS signal.	●	●
Primary Task – Flight Management		
Subtasks:		
Completes all necessary checks and drills	●	●
Configures airframe and engine(s) for cruise/ endurance performance in accordance with SOP manual	●	●
Manages aircraft navigation & terrain clearance	●	●

Flight Phase - Cruise A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Adjusts and monitors fuel/energy consumption for range or endurance as appropriate	●	●
Sets and cross checks altimeters to QNH, standard pressure setting as specified	●	●
Maintains effective R/T communications using correct phraseology throughout	●	●
Obtains ATC clearances and appropriate level of service	●	●
Adheres to ATC instructions	●	●
Avoid misunderstandings by requesting clarification	●	●
Primary Task – CU Management		
Subtasks:	●	●
Programs the CU with route specific information in accordance with SOPs	●	●
Programs the CU with performance specific information in accordance with SOPs	●	●
Cross-checks and seeks confirmation of all relevant information entered	●	●
Safely operates the CU whilst in flight	●	●
Modifies the CU data whilst in flight	●	●
Primary Task – Limited CU Panel		
Subtasks:		
Controls the aircraft using limited CU panel	●	●
Primary Task – Non-Normal Propulsion Failure in Flight		
Subtasks:		
Recognises the effect of an engine failure by sight, sound, instrumentation & performance	●	●
Maintains control of the aircraft by appropriate use of the CU	●	●
Gathers information and identifies the affected engine	●	●
Controls the aircraft accurately whilst conducting QRH procedures	●	●
Understands the relationship between power, attitude & speed	●	●
Controls the aircraft accurately on one engine whilst climbing, descending & turning	●	●
Understands the effect on the fuel system and takes appropriate action	●	●
Assesses situation & considers engine restart if appropriate	●	●
Primary Task – Non-Normal C2 Link Degradation in Flight		
Subtasks:		
Recognises link degradation by sound, instruments, and performance	●	●
Takes latency into account while executing CU commands	●	●
Controls the aircraft whilst conducting QRH procedures	●	●
Manages the non-normal situation ensuring a safe outcome	●	●
Primary Task – Non-Normal C2 Link Failure in Flight		
Subtasks:		
Recognises link degradation by sound, instruments, and performance	●	●
Conducts QRH procedures	●	●
Manages the non-normal situation ensuring a safe outcome	●	●
Primary Task – Non-Normal Navigation System Failure in Flight (GPS/IMU)		
Subtasks:		
Recognises navigation failure by sound, instruments, and performance	●	●
Conducts QRH procedures	●	●
Manages the non-normal situation ensuring a safe outcome	●	●
Primary Task – Non-Normal CU Total Failure		
Subtasks:		
Recognises CU failure	●	●

Flight Phase - Cruise A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Conducts QRH procedures	●	●
Conducts handover to qualified crew member in accidence with SOPs	●	●
Manages the non-normal situation ensuring a safe outcome	●	●

485

486 **Table 10 - Task Analysis Descending**

Flight Phase – Descending A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Primary Task – Decent Planning		
Subtasks:		
Checks weather of destination and alternate airport	●	●
Checks runway in use/FATO status	●	●
Check MSA and MEA	●	●
Conducts arrival briefing	●	●
Primary Task – Descending		
Subtasks:		
Uses available situation awareness tools prior to descending	●	●
Configures CU to manage power, altitude, and target rate of decent	●	●
Controls aircraft within approved flight envelope	●	●
Sets altimeter in accordance with procedures specified in the appropriate SOP	●	●
Identifies and avoids terrain and traffic threats	●	●
Primary Task – Descending Turns		
Subtasks:		
Uses available situation awareness tools prior to turning	●	●
Configures CU to manage power, bank angle, and rate of turn	●	●
Controls aircraft within approved flight envelope	●	●
Sets altimeter in accordance with procedures specified in the appropriate SOP	●	●
Identifies and avoids terrain and traffic threats	●	●
Primary Task – Emergency Decent		
Subtasks:		
Completes memory items and QRH procedures in accordance with SOPs	●	●
Transmits emergency call to ATC	●	●
Sets safe decent height	●	●
Considers approved ground risk and air risk during decision making	●	●
Closely monitors speed, altitude, and configuration	●	●
Primary Task – Aerodrome/FATO Arrival Procedures		
Subtasks:		
Complies with published arrival procedures	●	●
Sets altimeter and cross checks	●	●
Uses checklists and drills	●	●
Uses correct RT phraseology	●	●
Primary Task – Holding		
Subtasks:		
Interprets hold requirement and programmes CU according to SOPs	●	●
Enters and monitors hold	●	●
Assesses fuel requirements and max hold time	●	●
Primary Task – Aerodrome Rejoin		
Subtasks:		

Flight Phase – Descending A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Complies with published arrival procedure or clearance	●	●
Sets altimeters and cross checks	●	●
Uses checklists and drills	●	●
Uses correct RT phraseology	●	●
Maintains situational awareness	●	●

487

488 **Table 11 - Task Analysis Approach**

Approach A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Primary Task – Stable Approach		
Subtasks:		
Correctly configures the CU for approach	●	●
Correctly performs relevant checklists	●	●
Correctly applies altimeter settings for the phase of flight	●	●
Performs correct RT procedures	●	●
Correctly identifies and follows airfield approach procedures	●	●
Primary Task – Missed Approach		
Subtasks:		
Recognises missed approach/landing performance cannot be achieved	●	●
Uses the CU to configure and execute go-around in accordance with SOPs	●	●
Performs correct RT procedures	●	●

489

490 **Table 12 - Task Analysis Landing**

Landing A = Required for Aeroplanes | R = Required for Rotorcraft	**A**	**R**
Primary Task – Landing		
Subtasks:		
Correctly configures the CU for landing	●	●
Monitors automated landing system via the CU	●	●
Correctly performs relevant checklists	●	●
Correctly applies altimeter settings for the phase of flight	●	●
Performs correct RT procedures	●	●
Touches down at a controlled rate of decent	●	●
Touches down on the runway centreline	●	
Touches down on the centre of designated FATO		●
Performs a safe landing in accordance with SOPs	●	●
Performs post landing checklists	●	●

491
492

493 **Table 13 - Task Analysis Post Flight Actions**

Post Flight Actions A = Required for Aeroplanes | R = Required for Rotorcraft		
Primary Task – Shutdown		
Subtasks:		
Complies with aerodrome markings and signals	●	●

Post Flight Actions A = Required for Aeroplanes | R = Required for Rotorcraft		
Controls the aircraft with use of power and brakes	●	
Follows ATC Instructions	●	●
Follows landing checklist	●	●
Shuts down engine in accordance with SOPs	●	●
Carries out shutdown checklist	●	●
Primary Task – Post Flight Documentation		
Subtasks:		
Communicates with recovery team, ground personnel, and flight crew	●	●
Ensures aircraft is secure and CU is safely disconnected	●	●
Hands over aircraft to ground personnel remotely (land away)	●	●
Completes relevant aircraft documents, reports service issues and completes flight/tech logs	●	●

494

495

496

497

498

499

500

CHAPTER 6
Remote Pilot Competencies

The following tables contain recommended RP competencies and observable behaviours in accordance with ICAO PANS-TRG Doc 9868. These competencies could form the basis for the development of RP competency-based training (CBT). **The CAA are keen to hear feedback on the completeness of these competencies.**

Table 14 - Application of Knowledge

Application of Knowledge	
Description: Demonstrates knowledge and understanding of relevant information, operating instruction, aircraft systems and the operating environment.	
Observable Behaviours	
1	Demonstrates practical and applicable knowledge of limitations and systems and their interactions
2	Demonstrates required knowledge of published operating instructions
3	Demonstrates knowledge of the physical environment, the air traffic environment including routings, weather, airports, and the operational infrastructure
4	Demonstrates appropriate knowledge of applicable legislation
5	Knows where to source required information
6	Demonstrates a positive interest in acquiring knowledge
7	Can apply knowledge effectively

Table 15 - Application of Procedures & Compliance with Regulations

Application of Procedures & Compliance with Regulations	
Description: Identifies and applies procedures in accordance with published operating instructions and applicable regulations, using the appropriate knowledge	
Observable Behaviours	
1	Identifies the source of operating instructions
2	Follows standard operating procedures (SOPs) unless a higher degree of safety dictates an appropriate deviation
3	Identifies and follows all operating instructions in a timely manner
4	Correctly operates the UAS and associated equipment
5	Complies with applicable regulations
6	Applies relevant procedural knowledge

514

515 **Table 16 - Situational Awareness**

Situational Awareness	
Description: Perceives and comprehends the operational situation of the moment and all of the relevant information available and anticipates what could happen that may affect the operation	
Observable Behaviours	
1	Identifies and assesses accurately the state of the UAS
2	Identifies and assesses accurately the UAS vertical and lateral position, and its anticipated flight path
3	Identifies and assesses accurately the general environment as it may affect the flight, including the air traffic neighbouring the UAS operation and the meteorological conditions that could impact the operation
4	Conducts the operation in accordance with the airspace configuration where the UAS operation is taking place
5	Keeps track of time and energy
6	Maintains awareness of the people involved in or affected by the operation and their capacity to perform as expected
7	Anticipates accurately what could happen, plans, and stays ahead of the situation
8	Develops effective contingency plans based upon potential threats
9	Recognizes and effectively responds to indications of reduced situational awareness

516

517 **Table 17 - Communication**

Communication	
Description: Demonstrates effective verbal, written and nonverbal communications, in normal and abnormal situations	
Observable Behaviours	
1	Ensures the recipient is ready and able to receive the information
2	Selects appropriately what, when how and with whom to communicate
3	Conveys messages clearly, accurately, and concisely
4	Confirms that the recipient correctly understands important information
5	Listens actively and demonstrates understanding when receiving information
6	Asks relevant and effective questions – Adheres to standard radiotelephony phraseology and procedures
7	Accurately reads and interprets required documentation for the operation of UAS
8	Accurately reads, interprets, constructs and responds to datalink messages
9	Completes accurate reports as required by operating procedures
10	Correctly interprets non-verbal communication
11	Where applicable, uses eye contact, body movement and gestures that are consistent with and support verbal messages

518

519 **Table 18 - RPA flight path management, automation**

RPA flight path management, automation	
Description: Controls the RPA flight path through automation, including appropriate use of flight management system(s) and guidance	
Observable Behaviours	
1	Controls the RPA through automation with accuracy and smoothness as appropriate to the situation

RPA flight path management, automation	
2	Contains the RPA within the normal flight envelope
3	Maintains the desired flight path during flight using automation
4	Takes appropriate action in case of deviations from the desired RPA trajectory
5	Selects appropriate level and mode of automation in a timely manner considering phase of flight and workload
6	Effectively monitors automation, including engagement and automatic mode transitions
7	Controls the RPA safely in degraded automation using only the relationship between RPA attitude, speed and thrust if applicable

520

521 **Table 19 - Leadership, teamwork, and self-management**

Leadership, teamwork, and self-management	
Description: Demonstrates effective leadership, team working and self-management	
Observable Behaviours	
1	Understands and agrees with the crew's roles and objectives
2	Creates an atmosphere of open communication and encourages team participation
3	Uses initiative and gives directions when required
4	Admits mistakes and takes responsibility for own performance, detecting and resolving own errors
5	Anticipates and responds appropriately to other crew members' needs
6	Carries out instructions when directed
7	Communicates relevant concerns and intentions
8	Gives and receives feedback constructively
9	Confidently intervenes when important for safety
10	Demonstrates empathy and shows respect and tolerance for other people
11	Engages others in planning and allocates activities fairly and appropriately according to abilities
12	Addresses and resolves conflicts and disagreements in a constructive manner
13	Demonstrates self-control in all situations
14	Self-evaluates the effectiveness of actions

522

523 **Table 20 - Problem solving and decision making**

Problem solving and decision making	
Description: Accurately identifies risks and resolves problems. Uses the appropriate decision-making processes	
Observable Behaviours	
1	Seeks accurate and adequate information from appropriate sources
2	Identifies and verifies what and why things have gone wrong
3	Employs proper problem-solving strategies
4	Perseveres in working through problems without reducing safety
5	Uses appropriate and timely decision-making processes
6	Identifies and considers options effectively

Problem solving and decision making	
7	Monitors, reviews and adapts decisions as required
8	Identifies and manages risks and threats to the safety of the UAS and people effectively
9	Changes behaviour and responds as needed to deal with the demands of the changing situation

524

525

526 **Table 21 - Workload management**

Workload management	
Description: Manages available resources efficiently to prioritize and perform tasks in a timely manner under all circumstances	
Observable Behaviours	
1	Plans, prioritizes, and schedules tasks effectively
2	Manages time efficiently when carrying out tasks
3	Offers and accepts assistance, delegates when necessary and asks for help early
4	Reviews, monitors, and crosschecks actions conscientiously
5	Verifies that tasks are completed to the expected outcome
6	Manages and recovers from interruptions, distractions, variations and failures effectively

527