

Unmanned Aircraft Systems

Specific Category Operations- Pre-defined Risk Assessment Requirements, Guidance & Policy

CAP 722H

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Third Edition of CAP722H – April 2024

The latest version of this document is available in electronic format at www.caa.co.uk

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Revision history

Updates made since the previous edition are highlighted in red underline.

First Edition

December 2022

This is the first edition of this document. Content has been removed from CAP 722, and updated, for inclusion within this stand-alone document.

Second Edition

August 2023

This second edition of CAP 722H is to reflect the update to the risk assessment methodology contained within CAP 722A, provide assurance explanations to the identified mitigations and administrative amendments.

Third Edition

April 2024

This third edition of CAP722H is to update the document to align with the changes to the PDRA-01 application and oversight processes, whilst performing some administrative amendments.

Foreword

Purpose

The purpose of this document is to describe the concept of a Pre-defined Risk Assessment (PDRA), and to set out each PDRA available in the UK to UAS Operators for use in the Specific category only.

This document lays out the conditions and limitations for any PDRA developed and published by the Civil Aviation Authority (CAA).

Scope

This document applies only to Specific category operations.

Note 1: *PDRA*s published by Joint Authorities for Rulemaking on Unmanned Systems (JARUS), European Union Aviation Safety Agency (EASA) or any other body are currently not recognised within the UK.

Note 2: Further PDRAs are under development and will be published in future revisions of CAP 722H.

Availability

The latest version of CAP 722H can be located within the publications section of the CAA website.

Updated information can be found within the Unmanned Aircraft Systems (UAS) webpages latest updates section of the CAA website.

The CAA also provides a more general aviation update service via the SkyWise system, which can be filtered by subject matter for relevant UAS-related information.

Structure

Chapter 1 describes the policy and general requirements that relate to PDRAs;

Chapter 2 describes individual PDRAs, published by the CAA;

Chapter 3 provides supporting information to the PDRAs described in Chapter 2.

CAP 722H is part of the CAP 722 suite of UAS guidance and policy and can be found on the CAA [website](#).

Editorial practices

In this document the following editorial practices apply:

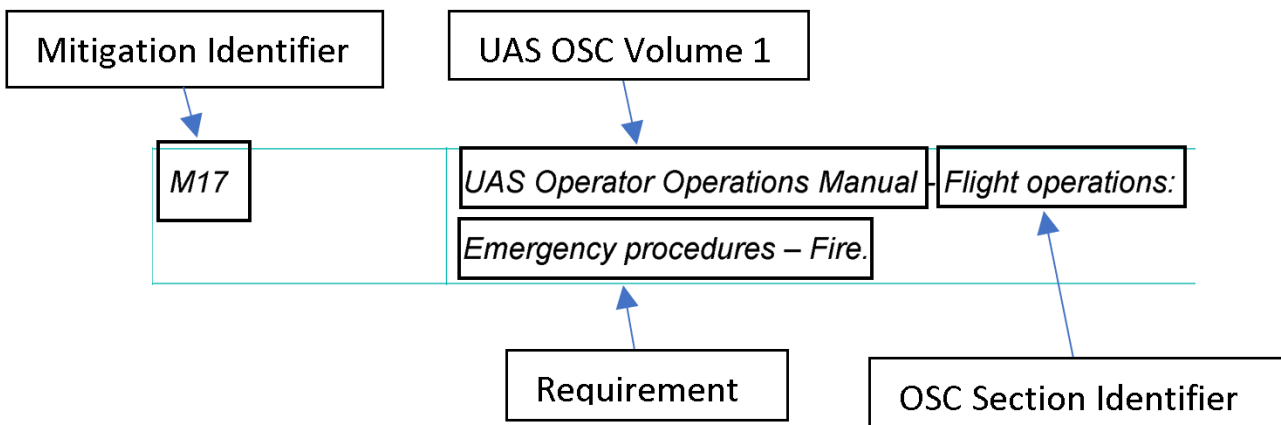
‘Must’ / ‘must not’ or **‘shall’** indicates a mandatory requirement.

‘Should’ indicates a strong obligation (in other words, a person would need to provide clear justification for not complying with the recommendation).

‘May’ indicates discretion.

‘Describe’ / ‘explain’ indicates the provision of logical argument and any available evidence that justifies a situation, choice, or action.

The information contained within Chapter 3 (mitigations) is displayed in the following format:



Not every mitigation will contain a link to the UAS Operational Safety Case (OSC) Operations Manual (OM) and may only contain a requirement.

Requirements are set out within blue boxes within each chapter.

Regulatory references, which support the requirement listed above, are included below in italics.

Point of contact

Unless otherwise stated, all enquiries relating to CAP 722H must be made to:

Future Safety and Innovation RPAS Unit

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Aviation House

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Abbreviations and glossary of terms

The definitive list of abbreviations and terms / definitions that are relevant to UAS operations within the UK and for the whole CAP 722 series of documents are centralised within CAP 722D UAS Definitions and Glossary.

Chapter 1 | GENERAL INTRODUCTION

1.1 Regulatory Requirements

The risk associated with any UAS operation carried out within the Specific category **must** be evaluated by the CAA, by means of a suitable risk assessment.

Article 12(1) of the [Assimilated Regulation \(EU\) 2019/947](#)

The CAA **must** be satisfied that the level of risk has been mitigated to an acceptable level, before an Operational Authorisation (OA) may be issued.

Article 12(2) of [UK Reg \(EU\) 2019/947](#)

PDRAs are used to satisfy the regulatory requirements above and facilitate certain, repeatable low risk, operations in the Specific category. This reduces the volume of evidence required, and administrative burden to both the operator and the CAA.

It is the UAS Operator's responsibility to ensure safe conduct of every flight. This includes flights conducted under a PDRA. UAS Operators still own and manage the associated risk and must carry out any dynamic risk assessment required, in accordance with their operational procedures within Volume 1 of their OM. It is the operator's responsibility to ensure that all risks identified are tolerable and 'as low as reasonably practicable' (ALARP) prior to conducting any operations under a PDRA.

The CAA will carry out the static risk assessment for operations covered under a PDRA. It will then publish the operation and its associated mitigations as a set of conditions and limitations in CAP 722H.

CAA risk assessments are based on the heat map methodology described within CAP 722A. This is the current acceptable method to ensure compliance with UK Reg (EU) 2019/947 Article 11: *Rules for conducting an operational risk assessment*. This methodology is used to assess the overall risk picture of the type of operation being performed.

The operator is responsible for managing and mitigating any additional risks that are identified as part of the operation.

This process then creates a set of standard operating conditions and limitations as well as any technical requirements that will become part of the OA. The operation must be conducted within the conditions and limitations of the OA at all times.

Following a successful application, this will result in a standardised OA being issued by the

CAA to the UAS Operator. No deviation or variation is possible to the conditions or limitations of a PDRA. Operations outside these limitations will require a separate application to the CAA, following the requirements and guidance set out in CAP 722A.

Regulatory requirements set out within the UK Reg (EU) 2019/947, or within any other applicable regulation, must also be complied with in addition to those conditions and limitations set out within the OA that relate specifically to a PDRA.

Application

Application for a PDRA OA must be made through the online web portal, here.
Refer to CAP 722 Chapter 2 for guidance

The documentation that is required is set out within individual PDRAs.

Applications made for a PDRA OA are subject to a separate fee as set out in the CAA Scheme of Charges (SoC). For a PDRA, there is no difference between an initial application and a renewal, and so any application (regardless of whether the operator already holds a PDRA based OA) is treated in the same way, and a single fee is charged.

1.2 Management of Changes to PDRAs

The CAA may make updates to the requirements, conditions, and limitations of a PDRA, at any time, by updating CAP 722H and the guidance within the online web portal. When a PDRA is updated, any UAS Operator who holds a current OA based on an old PDRA may continue to operate to the conditions and limitations within the OA. This will be updated to reflect the new PDRA upon renewal.

If the CAA issues a Safety Notice (SN) or Safety Directive (SD), it is the UAS Operator's responsibility to implement any changes necessary to their operation, procedures or aircraft prior to recommencing operations.

Note:

UAS Operators are responsible for the safe conduct of any flight. It is the applicant's responsibility to monitor CAP 722H for any changes to the PDRA, that must be taken into account prior to applying for a new PDRA based OA.

Chapter 2 | PRE-DEFINED RISK ASSESSMENTS

This chapter sets out each PDRA produced by the CAA in the following pages. Where necessary, supporting information can be found in Chapter 3 for individual PDRAs.

Chapter 2 Contents

PDRA Number	Description
UKPDRA01	<u>Visual Line of Sight (VLOS)</u> Operations within 150 metres of any Residential, Commercial, Industrial or Recreational Areas for UAS with a Maximum Take-Off Mass of less than 25kg

Table 1- Summary of PDRAs

2.1 UKPDRA01



PRE-DEFINED RISK ASSESSMENT – UKPDRA01

VLOS Operations within 150 metres of any Residential, Commercial, Industrial or Recreational Areas for UAS with a Maximum Take-Off Mass of less than 25kg

Summary

UKPDRA01 is designed to enable VLOS operations with UAS in areas that are likely to be more congested than the areas where subcategory A3 operations are permitted.

Operational Conditions and Limitations

What you can fly

- | | |
|-------------------------------------|---|
| <u>1 Model of unmanned aircraft</u> | <u>1.1 Any (rotary wing and/or fixed wing) unmanned aircraft with a MTOM/flying weight of less than 25kg.</u> |
|-------------------------------------|---|

Where and when you can fly

- | | |
|--------------------------|--|
| <u>2 Areas</u> | <u>2.1 Flights may be conducted within 150m of any residential, commercial, industrial, and/or recreational area.</u> |
| <u>3 Location</u> | <u>3.1 Any location in the UK, subject to the airspace restrictions set out in this authorisation.</u> |
| <u>4 Operating times</u> | <u>4.1 24 hours a day. Night operations must be carried out in accordance with the procedures in the operating manual.</u> |
| <u>5 Airspace</u> | <u>5.1 Flights must not be conducted within any applicable airspace restriction unless the appropriate permission to enter has been obtained. This includes: flight restriction zones (FRZs) around protected aerodromes and space sites; restricted, prohibited and danger areas (including temporary restrictions); and any other applicable restrictions.</u> |

6 Altitude, heights and levels

6.1 The unmanned aircraft must be maintained within 120 metres (400ft) from the closest point of the surface of the earth.

6.2 Obstacles taller than 105m may be overflown by a maximum of 15m under the following conditions:

- the person in charge of the obstacle must have requested this;
- and
- the unmanned aircraft must not be flown more than 50m horizontally from the obstruction.

7 Maximum operating range

7.1 Flights must be conducted within VLOS as per the definition given in UK Reg (EU) 2019/947, Article 2(7) and must not exceed 500m from the remote pilot. As noted in GM1 to Article 2(7) the maximum operating range will depend on the operator's ability to visually determine the aircraft's orientation at all times which may be affected by various factors including the time of day of the operation and environmental (weather) factors.

7.2 When operating within VLOS as defined in UK Reg (EU) 2019/947, Article 2(7), the remote pilot may be assisted by a competent observer who must be co-located with the remote pilot and able to communicate with them clearly and effectively. If present, the observer must maintain VLOS as per the definition given in UK Reg (EU) 2019/947, Article 2(7) at all times.

7.3 In order to remain within VLOS, as defined in UK Reg (EU) 2019/947, Article 2(7), the remote pilot may only change location during the flight, if still able to maintain control of the UAS at all times, and maintain situational awareness and orientation, as set out in the VLOS definition. This must be described within the Operations Manual procedures, if required.

Distances from people

8 Separation from uninvolved persons

8.1 Flights must not be carried out within 50m of uninvolved persons, except during take-off and landing, where this separation may be reduced to 30m.

8.2 Any overflight of uninvolved people must be kept to a minimum.

8.3 Flights must not be carried out within 50m horizontal separation of assemblies of people. Any overflight of assemblies of people must not be conducted.

– Lone remote pilots must have an appropriately set maximum allowed distance from launch/pilot and an appropriately set minimum return to home (RTH) battery level. (A lone remote pilot is a remote pilot who does not have any support crew next to them during the flight.)

8.5 Horizontal separation between the unmanned aircraft and assemblies of people must not be less than the height of the unmanned aircraft (i.e., the 1:1 rule).

Loads and equipment

9 Security of loads and equipment

9.1 The remote pilot must ensure that any load carried by, or equipment on, the unmanned aircraft is properly secured, and that the aircraft is in a safe condition for the specific flight.

9.2 Articles must not be dropped.

9.3 Dangerous goods must not be carried.

Remote pilots and operators

10 Remote pilot requirements

10.1 Remote pilots must:

- be employed or contracted by the UAS Operator,
 - hold a valid UK Flyer ID,
 - hold a valid GVC,
 - follow the requirements of UK Reg (EU) 2019/947, point UAS.SPEC.060, and
 - be qualified as per the requirements of the Operations Manual.
-

11 Operator requirements

11.1 The UAS Operator must:

- comply with the responsibilities set out in UK Reg (EU) 2019/947, point UAS.SPEC.050,
 - maintain records of each flight made under the Operational Authorisation, and
 - make such records available to the Civil Aviation Authority on request as per UK Reg (EU) 2019/947, point UAS.SPEC.090.
-

Other conditions

12 Occurrence reporting

12.1 Any occurrences that take place while operating under this authorisation must be reported in accordance with UK Reg (EU) 376/2014 and the requirements set out in CAP 722 section 2.7.

12.2 Any accidents that take place while operating under this authorisation must be reported in accordance with UK Reg (EU) 996/2010 to the UK AAIB.

13 Insurance

13.1 Insurance cover meeting the requirements of UK Reg (EU) 785/2004 must be held.

14 Control system failure

14.1 The unmanned aircraft must be equipped with a mechanism that will cause it to land in the event of a disruption to, or a failure of, any of its control systems, including the C2 Link.

14.2 The remote pilot must ensure that this mechanism is in working order before any flight is commenced.

15 Radio spectrum

15.1 The UAS Operator must ensure that the radio spectrum used for the C2 Link and for any payload communications complies with the relevant Ofcom requirements and that any licences required for its operation have been obtained.

16 High energy devices

16.1 The UAS Operator must ensure high energy devices are appropriately stored and transported.

17 Operator ID

17.1 The operator ID must be displayed on every aircraft flown under this Operational Authorisation.

18 Operating from moving vehicles

18.1 The remote pilot must not operate the UAS while operating any moving vehicle, or while in an aircraft.

18.2 The remote pilot may operate the unmanned aircraft from a moving vehicle as a passenger (excluding in an aircraft) as long as the vehicle's speed and stability is such that they are able to maintain VLOS and control of the unmanned aircraft at all times.

19 Environmental (weather) conditions

19.1 Weather conditions will directly influence where and when flights can be made.

19.2 It must be verified that the weather conditions at the time when the operation starts and those that are expected for the entire period of the operation are within limits defined in the manufacturer's manual, as well as with the OA or declaration, as applicable (UK Reg (EU) 2019/947 AMC1 UAS.SPEC.060(2)(b) Responsibilities of the Remote Pilot).

19.3 The UAS Operator and RP pilot should consider any weather factors that may increase the potential for loss of control of the aircraft, or loss of propulsion.

19.4 Operators should consider the use of appropriate weather products and assess the level of their personnel's skills in using weather products to make effective weather-related decisions (CAP722A, UAS OSC Volume 1 – OM) based on threat and error management principles.

19.5 Applicable mitigants should be reviewed to ensure that they are effective in adverse weather conditions. Conditions such as low temperature, low visibility, strong wind, and high levels of precipitation can impact the aircraft and operations, restricting when and where flights can be made.

2.2 PDRA01- Technical Characteristics of the System

Although PDRA01 only requires volume 1 of the OM to be produced, any applicant for a Specific category authorisation **must** include certain technical information on the UAS. This form has been produced to meet this requirement, without the need for a full volume 2 to be produced. This can be incorporated as an Annex within Volume 1.

Alternatively, if using the CAA produced template OM (CAP2606), this will be covered in section 3.

Article 11(2)(d) of the UK Reg (EU) 2019/947

Explain in detail the performance and technical characteristics (design flight envelope) of the unmanned aircraft (UA) using the table below. If applicants use more than one type of UAS for this PDRA, then this process must be completed for all platform types to be used.

Guidance Note: *This information could be extracted from the data sheet supplied by the manufacturer of the UAS to complete this requirement. Only fill in what is relevant and provided.*

Mass	Empty Mass	(Unit to be used Kg)
	Maximum Take-Off Mass (MTOM)	(This includes payloads and fuel)
Dimensions for Fixed-Wing	Wingspan	
	Fuselage Length	
	Fuselage Diameter	
Dimensions for Rotorcraft / Multirotor	Length of aircraft body	
	Width of aircraft body	
	Height of aircraft body	
	Propeller Dimensions	
	Propeller Configuration	
Centre of Gravity (CG)		(if applicable)

Flight Duration / Endurance	
Maximum Range	
Maximum Operating Height (Service Ceiling)	
Maximum Airspeed	

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Environmental / Weather Limitations	
Any other relevant information	

Fuel Type	
Status Indicators / Alert Messages	
Hazardous Substances	(if applicable)
Any other relevant information	

Batteries	Quantity	
	Type	
	Arrangement	
Electrical Loads		
Any other relevant information		

Engines	Type	
	Quantity	
	Propeller Type	
Any other relevant information		

Sensors (These are sensors that assist in the safe flight of the UA, and not the payload)	Type	
	Quantity	
Backup Means of Navigation and Guidance		(if fitted)
Automatic Flight Control Functions		(If fitted)
Geo-awareness Functions		(If fitted)
Any other relevant information		

C2 Link	Range	
Transceivers / Modems	Power Levels	
Operating Frequencies Used		
Third Party Link Service Provider		(If applicable)
Data Rates		
Latencies		
Any other relevant information		

Chapter 3 | SUPPORTING INFORMATION

3.1 PDRA01 Risk Assessment

Risk Assessment Assumptions:

- *Most realistic worst-case scenario used for severity scores using the highest mass UA.*
- *Initial likelihood scores are scored without any mitigations being in place.*
- *Risk assessment likelihood values are aggregated across the industry per annum and not on a per flight basis.*
- *It would be disproportionate to list all possible failures.*

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Unique No	Identified Hazard	Unmitigated Failures	Consequence	Initial Safety Risk Level (Severity, Likelihood)	Mitigations	Tolerable Y/N	ALARP Y/N	Final Safety Risk Level (Severity, Likelihood)
1a	Loss of Control in flight (due to RPAS technical malfunction)	<u>Failure mode:</u> Airframe failure <u>Failures:</u> Chassis failure Fixings failure	Mid Air Collision	Review (5,1)	M1, M4, M5, M7, M10, M11 M12, M13, M14, M15, M19, M20, M22, M24, M26, M27, M28, M29, M55	Y	Y	Review (5,1)
1b			Collision with Uninvolved Person	Unacceptable (5,3)	M1, M4, M5, M8, M11 M12, M13, M14, M15, M16, M17, M19, M20, M22, M24, M25, M26, M27, M28, M29, M55	Y	Y	Review (5,2)
1c			Collision with Assembly of people	Unacceptable (5,3)	M1, M4, M5, M8, M9, M11 M12, M13, M14, M15, M17, M19, M20, M22, M23, M24, M26, M27, M28, M29, M55	Y	Y	Review (5,1)

Unique No	Identified Hazard	Unmitigated Failures	Consequence	Initial Safety Risk Level (Severity, Likelihood)	Mitigations	Tolerable Y/N	ALARP Y/N	Final Risk Level (Severity, Likelihood)
1d	Loss of Control in flight (due to RPAS technical malfunction)	<u>Failure mode:</u> Avionics failure	Mid Air Collision	Unacceptable (5,3)	M1, M4, M5, M7, M10, M11 M12, M13, M14, M18, M19, M20, M22, M26, M27, M29, M55	Y	Y	Review (5,2)
1e		<u>Failures:</u> GNSS failure IMU Failure Flight Control System Failure	Collision with Uninvolved person	Unacceptable (5,3)	M1, M4, M5, M8, M11 M12, M13, M14, M15, M16, M17, M19, M20, M22, M24, M25, M26, M27, M29, M55	Y	Y	Review (5,2)
1f		Software expected result failure Other component failure	Collision with Assembly of people	Unacceptable (5,3)	M1, M4, M5, M9, M11 M12, M13, M14, M15, M17, M19, M20, M22, M23, M24, M26, M27, M29, M55	Y	Y	Review (5,1)

Unique No	Identified Hazard	Unmitigated Failures	Consequence	Initial Safety Risk Level (Severity, Likelihood)	Mitigations	Tolerable Y/N	ALARP Y/N	Final Risk Level (Severity, Likelihood)
1g	Loss of Control in flight (due to RPAS technical malfunction)	<u>Failure mode:</u> Propulsion failure	Mid Air Collision	Review (5,1)	M1, M4, M5, M7, M10, M11	Y	Y	Review (5,1)
		<u>Failures:</u> Motor failure			M12, M13, M14, M15, M18, M19, M20, M22, M24, M26, M27, M28, M29, M55			
1h		Propeller Failure	Collision with Uninvolved person	Unacceptable (5,4)	M1, M4, M5, M8, M10, M11	Y	Y	Review (5,2)
	Battery Failure	ESC Failure	M12, M13, M14, M15, M16, M17, M19, M20, M21, M22, M24, M25, M26, M27, M28, M29, M55					
1i		Power Distribution Failure	Collision with Assembly of people	Unacceptable (5,4)	M1, M4, M5, M9, M11	Y	Y	Review (5,1)
			M12, M13, M14, M15, M17, M19, M20, M21, M22, M23, M24, M26, M27, M28, M29, M55					

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Unique No	Identified Hazard	Unmitigated Failures	Consequence	Initial Safety Risk Level (Severity, Likelihood)	Mitigations	Tolerable Y/N	ALARP Y/N	Final Risk Level (Severity, Likelihood)
1j	Loss of Control in flight (due to RPAS technical malfunction)	<u>Failure mode:</u> Command Unit (CU) failure <u>Failures:</u> CU power failure Other component failure	Mid Air Collision	Review (5,2)	M1, M5, M7, M11, M10 M12, M13, M14, M18, M19, M20, M22, M24, M26, M27, M29, M55	Y	Y	Review (5,2)
1k			Collision with Uninvolved person	Review (5,2)	M1, M5, M8, M11 M12, M13, M14, M19, M20, M22, M24, M25, M26, M27, M29, M55	Y	Y	Review (5,2)
1l			Collision with Assembly of people	Review (5,2)	M1, M5, M9, M11 M12, M13, M14, M15, M17, M19, M20, M22, M23, M24, M26, M27, M29, M55	Y	Y	Review (5,1)

Unique No	Identified Hazard	Unmitigated Failures	Consequence	Initial Safety Risk Level (Severity, Likelihood)	Mitigations	Tolerable Y/N	ALARP Y/N	Final Risk Level (Severity, Likelihood)
2a	Loss of Control in flight (due to Degradation of Pilot/ Remote Crew Performance)	<u>Failure mode:</u> Pilot Incapacitation <u>Failures:</u> Fatigue ill-health Intoxication	Mid Air Collision	Unacceptable (5,3)	M2, M6, M7, M10, M53 M12, M18, M20, M22, M26, M30, M31, M32, M33, M34	Y	Y	Review (5,1)
2b			Collision with Uninvolved person	Unacceptable (5,3)	M2, M6, M8, M53 M12, M20, M22, M26, M30, M31, M32, M33, M34	Y	Y	Review (5,1)
2c			Collision with Assembly of people	Unacceptable (5,3)	M2, M6, M9, M53 M12, M20, M22, M23, M26, M30, M31, M32, M33, M34	Y	Y	Review (5,1)

Unique No	Identified Hazard	Unmitigated Failures	Consequence	Initial Safety Risk Level (Severity, Likelihood)	Mitigations	Tolerable Y/N	ALARP Y/N	Final Risk Level (Severity, Likelihood)
2d	Loss of Control in flight (due to Degradation of Pilot/ Remote Crew Performance)	<u>Failure mode:</u> Loss of situational Awareness <u>Failures:</u> Distractions Workplace Stress Mental Capacity Overload Ineffective Communications	Mid Air Collision	Unacceptable (5,4)	M2, M4, M6, M7, M10, M53 M12, M20, M22, M31, M32, M34, M36, M37, M55	Y	Y	Review (5,2)
2e			Collision with Uninvolved person	Unacceptable (5,4)	M2, M4, M6, M8, M53 M12, M20, M22, M31, M32, M34, M36, M37, M43, M50, M52, M55	Y	Y	Review (5,2)
2f			Collision with Assembly of people	Unacceptable (5,4)	M2, M4, M6, M9, M53 M12, M20, M22, M23, M31, M32, M34, M36, M37, M43, M50, M52, M55	Y	Y	Review (5,1)

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Unique No	Identified Hazard	Unmitigated Failures	Consequence	Initial Safety Risk Level (Severity, Likelihood)	Mitigations	Tolerable Y/N	ALARP Y/N	Final Risk Level (Severity, Likelihood)
2g	Loss of Control in flight (due to Degradation of Pilot/ Remote Crew Performance)	<p><u>Failure modes:</u> C2 link degradation</p> <p>GNSS degradation</p> <p>UAS environmental limitation exceedance</p> <p><u>Failure:</u> Incorrect assessment of the Operational Volume</p>	Mid Air Collision	Unacceptable (5,4)	M3, M4, M5, M6, M7, M10 M12, M18, M20, M22, M24, M26, M27, M34, M35, M37, M38, M39, M40, M41, M42, M43, M44, M45, M46, M47, M48, M51, M55	Y	Y	Review (5,2)
2h			Collision with Uninvolved person	Unacceptable (5,4)	M3, M4, M5, M6, M8 M12, M16, M20, M22, M24, M26, M27, M34, M35, M37, M38, M39, M40, M41, M42, M43, M44, M45, M50, M51, M52, M55	Y	Y	Review (5,2)
2i			Collision with Assembly of people	Unacceptable (5,4)	M3, M4, M5, M6, M9 M12, M20, M22, M23, M24, M26, M27, M34, M35, M37, M38, M39, M40, M41, M43, M44, M45, M50, M51, M52, M55	Y	Y	Review (5,1)

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Unique No	Identified Hazard	Unmitigated Failures	Consequence	Initial Safety Risk Level (Severity, Likelihood)	Mitigations	Tolerable Y/N	ALARP Y/N	Final Risk Level (Severity, Likelihood)
3a	Loss of airborne separation (due to airspace incursion)	<u>Failure mode:</u> Failure to deconflict Operational Volume (airspace) <u>Failures:</u> Ineffective airspace monitoring (in real-time) Loss of VLOS	Mid Air Collision	Unacceptable (5,4)	M3, M4, M4, M6, M7, M10, M54 M12, M14, M20, M22, M38, M46, M47, M48, M49, M55	Y	Y	Review (5,2)
3b			Collision with Uninvolved person	Review (5,2)	Same as above mid-air collision: Mitigations to prevent mid-air collision will inherently mitigate resulting collisions with persons on the ground.	Y	Y	Review (5,2)
3c			Collision with Assembly of people	Review (5,2)	Same as above mid-air collision: Mitigations to prevent mid-air collision will inherently mitigate resulting collisions with persons on the ground.	Y	Y	Review (5,2)

Unique No	Identified Hazard	Unmitigated Failures	Consequence	Initial Safety Risk Level (Severity, Likelihood)	Mitigations	Tolerable Y/N	ALARP Y/N	Final Risk Level (Severity, Likelihood)
4a	Loss of ground separation (due to ground incursion)	<p><u>Failure mode:</u> Failure to deconflict Operational Volume (ground)</p> <p><u>Failures:</u> Ineffective ground monitoring (in real-time)</p>	Collision with Uninvolved person	Unacceptable (5,4)	M3, M4, M6 M8 M12, M14, M16, M20, M22, M25, M50, M51, M52, M55	Y	Y	Review (5,2)
4b		<p>Ineffective communications</p>	Collision with Assembly of people	Unacceptable (5,4)	M3, M4, M6, M9 M12, M14, M16, M20, M22, <u>M23</u> , M50, M51, M52, M55	Y	Y	Review (5,1)

Mitigation Identifier	Mitigation Description	
M1	Mitigation	<p>Remote Pilot (RP) Competence: <i>The RP has completed the <u>Drone and Model Aircraft Registration and Education Service (DMARES) test and obtained a Flyer ID (test covers UAS General Knowledge).</u></i></p>
	Assurance	<p>The DMARES learning material requires a RP to gain a basic level of knowledge of their aircraft and guides the <u>RPRP</u> to understand their aircraft prior to flight. The learning material guides a <u>RPRP</u> to check the performance limitations of the aircraft, assess the battery levels, and if the software status of the UAS is appropriate. This reduces the likelihood of an unmanned aircraft being flown in an unsafe state.</p> <p>The adoption of a UK-wide flyer registration system is in place therefore providing a RP with a unique flyer-ID.</p> <p>An online 40-question test is required to be completed and passed by a <u>RPRP</u> therefore confirming the learning of the remote pilot.</p> <p>A <u>Regulatory Safety Management System (RSMS)</u> is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>
M2	Mitigation	<p><u>RP Competence:</u> <i>The RP has completed the <u>DMARES test and obtained a Flyer ID (test covers human performance limitations).</u></i></p>
	Assurance	<p>The DMARES learning material requires a <u>RP</u> to gain a basic level of knowledge of their fitness to fly safely. The learning material contains guidance regarding not flying when under the influence of alcohol, drugs, when tired, unwell, or while distracted. This reduces the likelihood of the <u>RPRP</u> being in an unsafe state to fly and treats the risk that actions are performed incorrectly.</p> <p>The adoption of a UK-wide flyer registration system is in place therefore providing a <u>RP</u> RP with a unique flyer-ID.</p> <p>An online 40-question test is required to be completed and passed by a <u>RP</u> RP therefore confirming the learning of the <u>RP</u>.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>

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M3	Mitigation	<p><i>RP Competence:</i> <i>The RP has completed the DMARES test and obtained a Flyer ID (test contains subjects; air safety, airspace restrictions and aviation regulation, operating procedures).</i></p>
	Assurance	<p>The DMARES learning material requires a <u>RP</u> to learn where they can fly their aircraft safely. The teaching material covers the height limit of 120m (400ft), flights in the vicinity of aerodromes, certain airspace restrictions, and operations in and around <u>Residential, Commercial, Industrial or Recreational Areas</u> and people. This reduces the likelihood that the unmanned aircraft will encounter a manned aircraft and an understanding of flights around people.</p> <p>The adoption of a UK-wide flyer registration system is in place therefore providing a <u>RP</u> with a unique flyer-ID.</p> <p>An online 40-question test is required to be completed and passed by a <u>RP</u> therefore confirming the learning of the remote pilot.</p> <p>A RSMS is in place which monitors occurrences where a pilot’s key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>
M4	Mitigation	<p><i>RP Competence:</i> <i>The RP must have the ability to maintain control of the unmanned aircraft, except in the case of a lost C2 link.</i></p>
	Assurance	<p>The <u>RP</u> must have the ability to maintain control of the unmanned aircraft to avoid collisions. This includes maintaining control of the UA in line with procedures set out in M36.</p> <p>When mobile (e.g., walking behind the unmanned aircraft on land or on a boat/ vessel if over water) additional considerations must be made for degradations in situational awareness, ability to maintain VLOS and perform manual intervention due to the dynamic environment. This therefore reduces the likelihood of a collision.</p> <p>A <u>RP</u> will assess their capability to maintain control of the unmanned aircraft prior to take-off.</p> <p>A pre-flight check performed by the <u>RP</u> prior to take-off therefore providing assurance that control will be maintained.</p> <p>A RSMS is in place which monitors occurrences where a pilot’s key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>

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M5	Mitigation	<p><u>RP Competence:</u> <i>Flights must only be performed by a RP who has read and understood the instruction manual provided by the manufacturer of the UAS and maintains awareness of manufacturer updates.</i></p>
	Assurance	<p>A <u>RP</u> who understands the performance limitations and functions of the unmanned aircraft can operate the unmanned aircraft effectively and reduce the likelihood of a loss of control.</p> <p>The <u>RP</u> is required to read the instructions manual and familiarise themselves with the unmanned aircraft and not perform flights within adverse operational volumes or environmental conditions.</p> <p>The functions and features, including the use of inbuilt safety systems of the unmanned aircraft, will be known to the <u>RP</u>.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to being unfamiliar with the aircraft.</p>
M6	Mitigation	<p><u>RP Competence:</u> <i>The <u>RP</u> is competent to establish what the maximum VLOS distance is for any given operation, based on the definition in <u>UK Reg (EU) 2019/947 Article 2(7)</u> and the supporting <u>Acceptable Means of Compliance/ Guidance Material (AMC/GM)</u>. The <u>RP</u> shall discontinue the flight if the operation poses a risk to other aircraft, people, animals, environment, or property. <u>RPs may be assisted by an unmanned aircraft observer positioned alongside the <u>RP</u>, who, by unaided visual observation of the unmanned aircraft, assists the <u>RP</u> in keeping the unmanned aircraft in VLOS and safely conducting the flight.</u></i></p>
	Assurance	<p>The <u>RP</u> can deconflict the operational volume by maintaining the unmanned aircraft within VLOS therefore avoiding collisions in the air and on the ground.</p> <p>The <u>RP</u> or unmanned aircraft observer must maintain VLOS of the unmanned aircraft and manage the separation distance between the <u>RP</u> or unmanned aircraft observer considering the operational volume, aircraft size, and visual conspicuity in light of the environmental conditions.</p> <p>The UAS Operator shall maintain records of the flights conducted, including any VLOS considerations prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>

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M7	Mitigation	<p><i>UAS Operator Responsibilities (SPEC.050 1(f) Responsibilities of the UAS Operator):</i> <i>The unmanned aircraft is no more than 120 metres or 400ft from the closest point of the surface of the earth.</i></p>
	Assurance	<p>This is below the height at which the majority of other, routine, airspace users operate. This lowers the probability of a collision with a manned aircraft.</p> <p>A <u>RP</u> shall identify the maximum distance from the surface within the operational volume and maintain the aircraft within this by setting an appropriate maximum height within the command unit if available, or by manually controlling the height if command unit functionality to limit maximum height is non-existent.</p> <p>The UAS Operator shall maintain records of the flights conducted, including operational volume topography and likelihood of encountering low flying manned aircraft prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where an unmanned aircraft has caused or has the potential to cause a mid-air collision.</p> <p>Note: This maximum height may have to be reduced, by the VLOS requirement, described in M6.</p>

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<p>M8</p>	<p>Mitigation</p>	<p><u>RP Competence:</u> <u>RPs must reasonably expect that uninvolved persons will not be intentionally overflown.</u></p> <p><i>However, any intentional overflight of uninvolved people must be assessed to be tolerable and ALARP by the UAS Operator whilst conducting any additional on-site risk assessments. The overflight of uninvolved people should always be minimised where possible, to reduce the risk of a collision with them, following a loss of control.</i></p> <p><i>In the event of unexpected overflight of uninvolved persons, the RP shall reduce as much as possible the time during which the unmanned aircraft overflies those persons.</i></p>
	<p>Assurance</p>	<p>The overflight of an uninvolved person must be kept to an absolute minimum and must not be performed if the technical malfunction of an aircraft could reasonably lead to a collision. This therefore reduces the likelihood of a collision.</p> <p>The <u>RP</u> must assess and record the risk of a collision due to overflight of an uninvolved person. The risk must be assessed during pre-deployment and/or on the on-site risk assessments prior to flight, and not be performed if the risk of a collision is not tolerable and ALARP. The guidance in CAP 722 (section 2.1.5.1) must be followed, within the volume 1 operational procedures.</p> <p>The <u>RP</u> must maintain records of flights, including any pre-flight risk assessments for intentional overflight (if any) and unintentional overflight for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>

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M9	Mitigation	<p><i>UAS Operator Responsibilities (SPEC.050 1(f) Responsibilities of the UAS Operator):</i> <u>RP</u> must not perform overflight of assemblies of people. A minimum of 50m horizontal distance must be maintained between an assembly of people and the unmanned aircraft and the horizontal distance shall be no less than the height (The 1:1 rule).</p>
	Assurance	<p>The overflight of an assembly of people must not be performed as any failure in the unmanned aircraft system will lead to a collision. The minimum horizontal separation in combination with the 1:1 rule reduces the likelihood that the aircraft will collide with an assembly of people.</p> <p>The <u>RP</u> must identify the assemblies of people within their operational volume and plan the flight path of the unmanned aircraft accordingly.</p> <p>The UAS Operator shall maintain records of the flights conducted, including operational volume identification of assemblies of people for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions caused or has the potential to cause a collision with an assembly of people.</p>
M10	Mitigation	<p><i>Permission for flights that are over or near aerodromes (ANO Article 94A)</i> The UAS Operator must obtain permission for a flight, or a part of a flight by a UAS in the <u>Flight Restriction Zone (FRZ)</u> of a protected aerodrome.</p>
	Assurance	<p>A restriction that separates unmanned aircraft from manned aircraft but does not prohibit unmanned aircraft from operating within a protected aerodrome environment allows for the risk of a collision to be managed.</p> <p>The <u>RP</u> must identify the protected aerodrome within their operational volume. Permission must be obtained, and aerodrome instructions must be adhered to if any part of the flight path enters an FRZ.</p> <p>The <u>RP</u> must maintain records of the flights conducted, including permissions obtained for flights within FRZs for a minimum of three years.</p> <p>A RSMS is in place which monitors intelligence sources where an unmanned aircraft enters and/or loses safe separation within an FRZ and takes appropriate actions to treat the risk.</p>

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M11	Mitigation	<p><u>RP Responsibilities (UAS.SPEC.060 Responsibilities of the RP):</u> <i>The RP shall ensure that the UAS is in a condition to safely complete the intended flight safely.</i></p>
	Assurance	<p>The confirmation of the aircraft safe state is obtained prior to commencing operations therefore reducing the likelihood of a technical failure risk.</p> <p>A pre-flight check of the aircraft is performed prior to the flight being commenced, along with an assessment of the aircraft control functions.</p> <p>The UAS Operator shall maintain records of the flights conducted, including pre-flight assessments and functionality assessments for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where an unmanned aircraft has caused or has the potential to cause a mid-air collision.</p>
M12	Mitigation	<p><u>General Visual Line of Sight Certificate (GVC) Course – Theoretical Syllabus</u> <i>The RP has received training on the following subjects as part of the GVC: Air Law/Responsibilities, UAS Airspace Operating Principles, Human performance Limitations, Meteorology, Navigation / Charts, Airmanship and Aviation Safety, UAS General Knowledge, Operator Responsibilities & Operating Procedures (Areas to be covered detailed in CAP722B).</i></p>
	Assurance	<p>The CAP722B GVC learning material requires a RP to increase their knowledge so that they may operate safely. The theoretical learning element of the course requires that a RP holds a sufficient level of understanding of the safety related areas to be covered so that they can determine the intent, the methods of compliance, and how this relates to their own intended operation. This provides assurance that the RP can safely and competently perform their duties.</p> <p>A RP has attended a GVC course delivered by a UK <u>Recognised Assessment Entity (RAE)</u> and completes a theoretical exam of at least 40 questions therefore confirming their knowledge.</p> <p><u>A valid certificate of competency is held by the RP and is presented to the CAA upon request through ongoing oversight during the validity of the OA. The RAE also provides the CAA with a list of issued certificates on a monthly basis.</u></p> <p>A RSMS is in place which monitors occurrences where a pilot’s key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to a lack of training.</p>

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M13	Mitigation	<p><i>GVC Course - 'UAS Operator Responsibilities':</i> <i>The UAS Operator maintenance regime shall include maintenance procedures (e.g., manufacturer recommended maintenance, user maintenance checklist, and maintenance frequency), safe handling procedures, transportation and storage procedures, and procedures regarding (monitoring) firmware releases from the manufacturer.</i></p>
	Assurance	<p>A <u>RP</u> who holds a valid UK GVC is sufficiently trained to understand the UAS Operator responsibilities in relation to maintenance procedures.</p> <p>A <u>RP</u> has attended a GVC course delivered by a UK RAE where they developed an understanding of UAS Operator responsibilities in relation to maintenance procedures.</p> <p>A valid certificate of competency is held by the <u>RP</u> and is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u>. The RAE also provides the CAA with a list of issued certificates on a monthly basis.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to a lack of training.</p>

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M14	Mitigation	<p><i>GVC Course - Practical Flight Test:</i> <i>The <u>RP</u> has passed the GVC practical flight test. This includes demonstrating flight procedures and normal procedures for operational volume defined by VLOS and up to 500m horizontally from the RP and 400ft above surface level for multicopter and/or fixed-wing unmanned aircraft.</i></p>
	Assurance	<p>A <u>RP</u> must undertake a practical flight test provided by an RAE therefore providing assurance that the <u>RP</u> can safely undertake a wide range of VLOS activities.</p> <p>A <u>RP</u> has attended a GVC course delivered by a UK RAE where the <u>RP</u> was tested against the assessment criteria contained within CAP722B.</p> <p>A valid certificate of competency is held by the <u>RP</u> and is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u>. The RAE also provides the CAA with a list of issued certificates on a monthly basis.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>
M15	Mitigation	<p><i>GVC Course - Practical Flight Test:</i> <i>The <u>RP</u> has passed the GVC practical flight test including demonstrating effective use of UAS Operator pre- and post-flight checks, visual inspection of aircraft structure and security (use of checklists)</i></p>
	Assurance	<p>A <u>RP</u> must undertake a practical flight test provided by an RAE therefore providing assurance that the <u>RP</u> can safely and competently inspect the unmanned aircraft prior to flight.</p> <p>A <u>RP</u> has attended a GVC course delivered by a UK RAE where the <u>RP</u> was tested against the assessment criteria contained within CAP722B.</p> <p>A valid certificate of competency is held by the <u>RP</u> and is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u>. The RAE also provides the CAA with a list of issued certificates on a monthly basis.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>

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M16	Mitigation	<p><i>UAS Operator's <u>OM</u> – On-site Procedures for Site survey: The UAS Operator's <u>OM</u> details guidance on the selection of alternate operating sites and cordon procedures with third-party management.</i></p>
	Assurance	<p>The <u>OM</u> details how to safely undertake procedures that put in place mitigations to reduce the likelihood of a collision with an uninvolved person.</p> <p>The <u>RP</u> must identify alternate operating sites within their operational volume and establish an appropriate site-specific cordon.</p> <p>The UAS Operator shall maintain records of the flights conducted, including alternate site selection and details of cordon for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions caused or has the potential to cause a collision an uninvolved person.</p>
M17	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations: The UAS Operator's <u>OM</u> includes emergency fire procedures.</i></p>
	Assurance	<p>The <u>OM</u> details the procedures to be performed in case of an emergency therefore reducing the likelihood of injury to an uninvolved person.</p> <p>The <u>OM</u> contains a set of instructions that must be performed in the case of a fire in the air or on the ground.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures.</p> <p>A RSMS is in place which monitors occurrences of unmanned aircraft fire.</p>

M18	Mitigation	<p><i>UAS Operator's <u>OM</u> – Flight operations:</i> <i>The UAS Operator's <u>OM</u> includes emergency flyaway procedures</i></p>
	Assurance	<p>The <u>OM</u> details the procedures to be performed in case of an emergency therefore reducing the likelihood of injury to an uninvolved person.</p> <p>The <u>OM</u> contains a set of instructions that must be performed in the case of a flyaway.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures</p> <p>A RSMS is in place which monitors occurrences of <u>UA</u> flyaway.</p>
M19	Mitigation	<p><i>UAS Operator - Logs and records:</i> <i>The maintenance activities that have been conducted on UAS.</i></p>
	Assurance	<p>Logging of maintenance activities allows for technical issues to be detected and prevented prior to flight therefore reducing the likelihood of a technical malfunction.</p> <p>The UAS Operator is responsible for recording the maintenance activities performed on the <u>UA</u>.</p> <p>The aircraft maintenance logs are presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u>.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential for technical failures.</p>

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M20	Mitigation	<p><u>RP Responsibilities (UAS.SPEC.060 Responsibilities of the RP):</u> <i>The RP shall comply with the UAS Operator's procedures.</i></p>
	Assurance	<p>The UAS Operator <u>OM</u> contains the procedures and guidance on how a <u>RP</u> performs flights safely therefore reducing the likelihood of a collision.</p> <p>The <u>RP</u> complies with the UAS Operator's procedures whereas UAS Operator ensures that the <u>RP</u> follows their procedures.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures. The CAA also has a whistleblowing policy (see CAA website) where all complaints will be investigated in an appropriate manner.</p>
M21	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations:</i> <i>The UAS Operator's <u>OM</u> includes on-site procedures for refuelling including changing, charging of batteries and/or replenishment of liquid fuels.</i></p>
	Assurance	<p>The <u>OM</u> details how to safely and correctly refuel the unmanned aircraft therefore reducing the likelihood of a battery or fuel failure that could lead to a collision with an uninvolved person.</p> <p>The <u>RP</u> performs the procedures in accordance with the UAS Operator's <u>OM</u>.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>

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M22	Mitigation	<p><i>UAS Operator's Responsibilities (UAS.SPEC.050 Responsibilities of the UAS Operator):</i> <i>The UAS Operator's <u>OM</u> establishes procedures and limitations adapted to the type of the intended operation and the risk involved</i></p>
	Assurance	<p>The type of operation performed by the <u>UA</u> presents different types of risks including aircraft and payload therefore the associated procedures must be adapted in order to manage these risks.</p> <p>The UAS Operator adapts their <u>OM</u> to safely perform the intended type of operations.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures</p> <p>A RSMS is in place along with a whistle blowing process. The CAA auditing team conduct audits on <u>OA</u> holders to ensure compliance.</p>

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<p>M23</p>	<p>Mitigation</p>	<p><i>UAS Operator's <u>OM</u> – Flight operations: When operating near assemblies of uninvolved people the <u>UA</u> must have an appropriately set <u>automatic limitation for the portion of airspace it can enter which limits the position of the UA.</u></i></p> <p><i>When operating as a lone <u>RP</u> (no observer / payload operator) and near assemblies of uninvolved people the aircraft must also have an appropriately set minimum RTH battery level. Any automatic recovery system (e.g. RTH) function must not permit return flight over or within 50m of an assembly of uninvolved people.</i></p>
	<p>Assurance</p>	<p>A technical means to mitigate against an <u>UA</u> overflying an assembly of people reduces the likelihood of a collision with an uninvolved person. A <u>RP</u> with no additional crew does not have the means to initiate any automatic recovery system once incapacitated. The aircraft automatic recovery system function must be configured so as to initiate at an appropriate battery level. The <u>RP</u> must plan its return flight path as to not overfly assemblies of people. This therefore reduces the likelihood of a collision with an assembly of people.</p> <p>The <u>RP</u> must identify any assemblies of people within their operational volume and establish an appropriately set distance from the boundary of the assembly, using the aircraft navigation systems, its return to home path, and the RTH battery level.</p> <p>The UAS Operator shall maintain records of the flights conducted, including appropriate measure taken when the operational volume contains assemblies of people for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions caused or has the potential to cause a collision with an assembly of people.</p>

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M24	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations:</i> <i>The UAS Operator's OM includes a statement that the <u>RP</u> will remain within manufacturer recommended performance envelopes of the UAS at all times.</i></p>
	Assurance	<p>A <u>RP</u> understands their responsibility to ensure the aircraft remains within its recommended performance envelope providing assurance that the <u>RP</u> understands the performance envelope and their safety responsibilities during each flight.</p> <p>The <u>RP</u> is required to read the instructions manual and familiarise themselves with the <u>UA</u>. They shall also understand and discharge their responsibilities to maintain the aircraft within its envelope.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain a statement.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures. The CAA also has a whistleblowing policy (see CAA website) where all complaints will be investigated in an appropriate manner.</p>

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M25	Mitigation	<p><i>UAS Operator's <u>OM</u> – Flight operations:</i></p> <p>The UAS Operator's <u>OM</u> details the scope of the flight operations for all types of <u>UA</u> (e.g., multirotor and fixed-wing). This includes limitations during normal procedures, during take-off and landing (i.e., 30m separation from third-parties), and whilst in flight (i.e., 50m separation from third-parties with any overflight of people kept to a minimum).</p>
	Assurance	<p>The <u>OM</u> details the limitations of the <u>OA</u> and how to safely undertake procedures to maintain safe separation therefore reduce the likelihood of a collision with an uninvolved person.</p> <p>The UAS Operator describes the limitations within their <u>OM</u> and the procedures that enables the pilot to safely perform the intended type of operations.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate limitations.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>
M26	Mitigation	<p><i><u>UA Technical Requirement</u></i></p> <p><i>The UAS must be equipped with a mechanism that will cause it to land in the event of a disruption to, or a failure of, any of its control systems.</i></p>
	Assurance	<p>A technical mitigation that enables the <u>UA</u> to land if in the event of a disruption to, or a failure of, any of its control systems. This therefore reduces the likelihood of a collision.</p> <p>The UAS Operator only utilises aircraft that have the capability to recognise a control system failure and to land automatically.</p> <p>The UAS Operator must hold details of the technical characteristics of the system, specifically including the mechanism.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions caused or has the potential to cause a collision an uninvolved person.</p>

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M27	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations:</i> The UAS Operator's <u>OM</u> contains functionality checks prior to flight (e.g., pilot assessment of controller responses and software functionality), take-off procedures, and an automatic recovery system test procedure before operation commences.</p>
	Assurance	<p>The implementation of a procedure that a <u>RP</u> must follow to gain assurance that the aircraft is in a safe state to perform the flight and that the recovery system is configured appropriately in case of an emergency.</p> <p>The UAS Operator has implemented a procedure within their <u>OM</u> appropriate to the aircraft type. The <u>RP</u> shall activate the automatic recovery system prior to flight by either physically activating the mechanism or performing a pre-flight check that the mechanism is configured correctly e.g. power off CU.</p> <p>The UAS Operator shall maintain records of the flights conducted, including the pre-flight procedures conducted prior to the operation commencing, for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>
M28	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations:</i> <i>The UAS Operator's <u>OM</u> describes the pre and post-flight checks to be conducted. These should include a visual inspection of the unmanned aircraft structure to ensure security of objects such as access panels, engines / motors, propellers / rotors, landing gear and external loads using a checklist. A visual inspection of the battery installation to ensure secure battery installation as per manufacturer guidance and ensure battery or liquid fuel level is sufficient for flight should be conducted before each flight.</i></p>
	Assurance	<p>The implementation of appropriate pre and post-flight procedures ensures that the <u>RP</u> is assured that the <u>UA</u> is in a safe state to fly prior to commencing each operation. This therefore reduces the likelihood of a technical failure.</p> <p>The UAS Operator has implemented appropriate procedures within their <u>OM</u> specific to the aircraft type.</p> <p>The UAS Operator shall maintain records of the flights conducted, including the check conducted, prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>

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M29	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations:</i> <i>UAS Operator maintenance regime shall include - Maintenance procedures (e.g., manufacturer recommended maintenance, user maintenance checklist, and maintenance frequency), safe handling procedures, transportation and storage procedures, and procedures regarding (monitoring) firmware releases from the manufacturer.</i></p>
	Assurance	<p>The implementation of maintenance activities through maintenance procedures which follow manufacturer recommendations reduces the likelihood of aircraft technical failures. This therefore reduces the likelihood of a technical failure.</p> <p>The UAS Operator has implemented appropriate procedures within their <u>OM</u> specific to the aircraft type.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must detail the maintenance procedures which are appropriate to each aircraft. The UAS Operator shall maintain records of the maintenance activities conducted, including battery logs and firmware updates, for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of technical failure due to ineffective procedures.</p>
M30	Mitigation	<p><i><u>RP</u> Competence:</i> <i>The <u>RP</u> shall conduct a self-appraisal of health and ability to perform safely prior to flying. Other support staff shall have the ability to perform their roles safely.</i></p>
	Assurance	<p>The ability to perform a self-appraisal of personal health and ability, prior to flight provides assurance that the <u>RP</u> and support staff can safely perform the intended flight. This therefore reduces the likelihood of degradation in pilot and remote crew performance.</p> <p>The <u>RP</u> and any support personnel are required to assess and record their fitness and capability prior to conducting planned operations.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must detail the crew health requirements, and the UAS Operator shall maintain records of the flights conducted including the pre-flight fitness assessment for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>

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M31	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations:</i></p> <p>The UAS Operator's <u>OM</u> contains guidance including a crew health policy on maximum working periods or duty hours, managing societal and commercial pressure, and substance abuse.</p>
	Assurance	<p>The provision of guidance and policies on crew health enables the <u>RP</u> and any support personnel to maintain their fitness and capability whilst providing assurance that a degradation in crew performance should not occur due to poor health.</p> <p>The UAS Operator has implemented guidance and policies within their <u>OM</u> appropriate to the type of operations being performed.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must detail the crew health requirements.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>
M32	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations:</i></p> <p><i>The UAS Operator's <u>OM</u> shall include an alcohol and psychoactive substances limitations policy.</i></p>
	Assurance	<p>The implementation of policies and procedures to gain assurance that the crew is fit and capable to conduct planned operations reduces the likelihood of a degradation in pilot and remote crew performance.</p> <p>The UAS Operator has implemented an alcohol and psychoactive substances limitations policy within their <u>OM</u>.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must detail the crew health requirements including an alcohol and psychoactive substances limitations.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective policies.</p>

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<p>M33</p>	<p>Mitigation</p>	<p><i>UAS Operator's <u>OM</u> – Flight operations: The UAS Operator's <u>OM</u> shall include an emergency procedure for pilot incapacitation and the correct configuration of the automatic recovery system.</i></p>
	<p>Assurance</p>	<p>The implementation of a procedure to be performed in case of an emergency therefore reducing likelihood of injury to an uninvolved person.</p> <p>The UAS Operator has implemented a set of instructions that must be performed in the case of <u>RP</u> incapacitation including the appropriate set up of the automatic recovery system when conducting lone <u>RP</u> operations.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures.</p> <p>A RSMS is in place which monitors occurrences of pilot incapacitation.</p>
<p>M34</p>	<p>Mitigation</p>	<p><i>UAS Operator's <u>OM</u> – Flight operations: The UAS Operator's <u>OM</u> contains normal procedures (multirotor and fixed-wing) for operational volume defined by VLOS and up to 500m horizontally from the <u>RP</u> and up to 400ft above surface, note difference between single and multi-crew operations.</i></p> <p><i>Situations where the <u>RP</u> is situated on a moving vehicle, and the vehicle may need to deviate from the intended flight path of the <u>UA</u>, such that VLOS is not able to be maintained, would place the operation outside the scope of PDRA01.</i></p>
	<p>Assurance</p>	<p>The implementation of normal procedures details how to safely perform operations and what is expected to be within the operational volume therefore reducing the likelihood of human error.</p> <p>The UAS Operator has implemented normal operating procedures and expected operational volume details within their <u>OM</u> for the pilot to safely perform the intended type of operations.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>

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M35	Mitigation	<p><i>UAS Operator's <u>OM</u> – Flight operations: The UAS Operator's <u>OM</u> contains procedures for VLOS operations at night –and shall include daylight reconnaissance and site safety assessment of the surrounding area, identification and recording of any hazards, restrictions and obstacles, illumination of the launch site, aircraft lighting / illumination requirements, and weather limitations for operation.</i></p>
	Assurance	<p>The implementation of procedures on how to safely perform night operations including the additional operational and technical requirements reduces the likelihood of human error.</p> <p>The UAS Operator has implemented procedures to operate at night including, but not limited to, conducting a daylight reconnaissance and site survey of the surround area, conducting an onsite risk assessment which records potential hazards and their associated mitigations, and lighting requirements.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>

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<p>M36</p>	<p>Mitigation</p>	<p><i>UAS Operator's <u>OM</u> – Flight operations: The UAS Operator's <u>OM</u> contains onsite procedures including, but not limited to, crew briefing (e.g., site awareness, <u>weather conditions</u> and self-positioning), use of cordon control measures, and location of crew relative to the take-off and landing point. This includes instances where the <u>RP</u> may change position during the flight. (for situations where the <u>RP</u> or unmanned aircraft observer are mobile e.g. walking or on a moving vehicle).</i></p> <p><i>The <u>RP</u> must not operate a unmanned aircraft while operating any moving vehicle, or whilst in an aircraft . If the <u>RP</u> operates the <u>UA</u> from a moving vehicle as a passenger, the speed and stability of the vehicle must be sufficient for the <u>RP</u> to maintain VLOS and control of the <u>UA</u> at all times.</i></p>
	<p>Assurance</p>	<p>The onsite procedures detail how a pilot and crew shall safely perform operations with considerations on crew positioning, setting up a cordon, and any safety briefings therefore reducing the likelihood of human error.</p> <p>The UAS Operator has implemented on-site procedures within their <u>OM</u> for the crew to safely perform the intended type of operations including how changing the position of the <u>RP</u> during flight is carried out safely.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>

M37	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations: The UAS Operator's <u>OM</u> shall include pre-flight checks specifically for the correct set up of automatic recovery system (e.g. RTH).</i></p>
	Assurance	<p>The implementation of a procedure that a <u>RP</u> must follow for the correct set up of the automatic recovery system reduces the risk of a harmful consequence resulting from the hazard.</p> <p>The UAS Operator has implemented a set of instructions that must be performed to set up the automatic recovery system with considerations to the type of operation being performed and the operational volume.</p> <p>The UAS Operator shall maintain records of the flights conducted, including the checks conducted, prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>

M38	Mitigation	<p><u>RP Competence:</u> <i>The RP is competent to <u>make effective weather-related decisions based on reference to appropriate weather products and their own observations of current weather conditions</u>, including the ability to detect aircraft path deviation due to wind conditions, understanding of aircraft design flight envelope.</i></p>
	Assurance	<p>The <u>RPs</u> ability to maintain the aircraft within the operational volume and its design flight envelope for changing weather conditions, reduces the likelihood of a harmful consequence resulting from the hazard.</p> <p>A <u>RP</u> has attended a GVC course delivered by a UK RAE where they developed an understanding of the effects of weather and are tested against the assessment criteria contained within CAP722B.</p> <p>A valid certificate of competency is held by the <u>RP</u> and is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u>. The RAE also provides the CAA with a list of issued certificates on a monthly basis.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>

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<p>M39</p>	<p>Mitigation</p>	<p><i>UAS Operator's <u>OM</u> - Flight operations:</i> <i>The UAS Operator's <u>OM</u> shall contain pre-flight checks for obtaining an appropriate weather forecast for the intended area of operation, local weather conditions, the space weather state and applicable UAS operating limitations (wind and water ingress resistance, UAS design flight envelope, <u>operating temperature parameters</u>) prior to flight.</i></p>
	<p>Assurance</p>	<p>The implementation of a procedure to assess the environmental conditions of the operational volume with regards to the aircraft design flight envelope reduces the likelihood that the aircraft will exceed its environmental limitations.</p> <p>The UAS Operator has implemented policies and procedures that must be performed in order to assess the environmental conditions of the operational volume prior to commencing operations using appropriate weather, including space weather (solar weather) products. For details regarding appropriate weather products see CAP722A (UAS OSC Volume 1 – OM, Paragraph 1.4.9).</p> <p>The UAS Operator shall maintain records of the flights conducted, including the checks conducted and <u>appropriate details regarding the weather products used in carrying out the assessment of environmental condition</u>, prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>
<p>M40</p>	<p>Mitigation</p>	<p><i>UAS Operator's <u>OM</u> - Flight operations:</i> The UAS Operator's <u>OM</u> shall contain emergency procedures (e.g., abnormal environmental conditions such as C2 Link Loss, sudden increase in wind speed, or decrease in visibility).</p>
	<p>Assurance</p>	<p>The implementation of a procedure to be performed in case of an emergency therefore reducing likelihood of injury to an uninvolved person.</p> <p>The UAS Operator has implemented a set of instructions that must be performed in the case of abnormal environmental conditions.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures</p> <p>A RSMS is in place which monitors abnormal environmental related occurrences.</p>

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M41	Mitigation	<p><u>RP Competence:</u> <i>The <u>RP</u> has been trained to recognise and manage client, peer, and company pressure to perform in inappropriate meteorological conditions.</i></p>
	Assurance	<p>The <u>RPs</u> ability to recognise and not perform a flight if the environmental conditions are outside of the aircraft design flight envelope reduces the likelihood that the aircraft will exceed its environmental limitations.</p> <p>A <u>RP</u> has attended a GVC course delivered by a UK RAE where they developed an understanding of the effects of stress/ pressure from 'customers' and are tested against the assessment criteria contained within CAP722B.</p> <p>A valid certificate of competency is held by the <u>RP</u> and is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u>. The RAE also provides the CAA with a list of issued certificates on a monthly basis.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to a lack of training.</p>

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M42	Mitigation	<p><i>GVC Course - Practical Flight Test:</i></p> <p><i>The <u>RP</u> has passed the GVC practical flight test including: flight handling capability around ground-based objects with knowledge of vortexing around structures /terrain and in-flight awareness of UAS position in operational volume, ability to use flight telemetry distance indicator and appropriate site survey to gauge distances to visible objects in operating volume, understanding of aircraft design flight envelope and maintenance of suitable safe boundaries around object.</i></p>
	Assurance	<p>A <u>RP</u> must undertake a practical flight test provided by an RAE, providing assurance that the <u>RP</u> can safely and competently mission plan (to include meteorological checks), airspace considerations, and site risk-assessment and maintain situational awareness of the intended operation.</p> <p>A <u>RP</u> has attended a GVC course delivered by a UK where the <u>RP</u> was tested against the assessment criteria contained within CAP722B.</p> <p>A valid certificate of competency is held by the <u>RP</u> and is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u>. The RAE also provides the CAA with a list of issued certificates on a monthly basis.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>

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<p>M43</p>	<p>Mitigation</p>	<p><i>UAS Operator's <u>OM</u> - Flight operations: The UAS Operator's <u>OM</u> shall contain on-site procedures for site survey identifying hazards (e.g., proximity to third parties, roads, animals, traffic, aeronautical activities, and danger areas) and conducting additional risk assessments (e.g., appropriate choice of <u>RP</u> and proposed crew operating location to avoid slips, trips, and falls <u>potential and/or actual environmental/weather conditions</u>).</i></p>
	<p>Assurance</p>	<p>The on-site procedures detail how a <u>RP</u> and crew shall perform the on-site survey and implement additional mitigations prior to flight therefore reducing the likelihood of human error.</p> <p>The UAS Operator has implemented on-site procedures within their <u>OM</u> for the crew to safely perform the intended type of operations.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>
<p>M44</p>	<p>Mitigation</p>	<p><i>UAS Operator's <u>OM</u> - Flight operations: The UAS Operator's <u>OM</u> contains operating procedures including antenna directionality and effective range, GNSS signal susceptibility to ferrous structures and avoidance of harmful interference e.g. proximity to HIRF reflectance and shadowing. Understanding of aircraft design flight envelope and maintenance of suitable safe boundaries around object.</i></p>
	<p>Assurance</p>	<p>The implementation of procedures to select and configure the unmanned aircraft and plan the aircraft flight path with awareness of the operational ground volume for sources of interference. This therefore reduces the likelihood that the unmanned aircraft C2 link will degrade due to sources of ground-based interference.</p> <p>The UAS Operator has implemented procedures for the identification of sources of interference within the potential operating area prior to commencing operations.</p> <p>The UAS Operator shall maintain records of the flights conducted, including ground-based sources of interference, prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>

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<p>M45</p>	<p>Mitigation</p>	<p><i>UAS Operator's <u>OM</u> - Flight operations: The UAS Operator's <u>OM</u> shall contain procedures for determining the intended task feasibility and site assessment, for efficient use of radio spectrum, Awareness of solar weather state, awareness of the <u>Office of Communications (OFCOM)</u> nationally allowed power outputs, and to ensure sufficient satellites in range before commencing flight.</i></p>
	<p>Assurance</p>	<p>The implementation of procedures to assess the <u>Radio Frequency (RF)</u> environmental conditions for the operational volume with regards to the aircraft design flight envelope. This therefore reduces the likelihood that the unmanned aircraft C2 link will degrade due to sources of environmental interference.</p> <p>The UAS Operator has implemented policies and procedures for the assessment of the <u>RF</u> conditions of the potential operating area prior to commencing operations.</p> <p>The UAS Operator shall maintain records of the flights conducted, including the <u>RF</u> assessment, and space weather state, prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>
<p>M46</p>	<p>Mitigation</p>	<p><i>UAS Operator's <u>OM</u> – Flight operations: The UAS Operator's <u>OM</u> shall contain procedures for determining the intended task feasibility, Site assessment for airspace classification and airspace restrictions.</i></p>
	<p>Assurance</p>	<p>The implementation of procedures for the assessment of the air environment within the intended operational volume for airspace classifications, restrictions, and the potential to encounter other aircraft reduces the likelihood of a mid-air collision.</p> <p>The UAS Operator has implemented procedures for the assessment of the air environment in the operational volume prior to commencing operations.</p> <p>The UAS Operator shall maintain records of the flights conducted, including the air environment assessment, prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>

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M47	Mitigation	<p><i>UAS Operator's <u>OM</u> – Flight operations: The UAS Operator's <u>OM</u> contains procedures for pre-notification to third parties (e.g., FRZ permission, restricted airspace access and NOTAM) and any local aviation stakeholders.</i></p>
	Assurance	<p>The implementation of procedures to notify and gain permissions to operate within certain air environments reduces the likelihood of a mid-air collision.</p> <p>The UAS Operator has implemented procedures to notify and gain permission relevant aviation stakeholders in the operational volume prior to commencing operations.</p> <p>The UAS Operator shall maintain records of the flights conducted, including any notifications and permissions, prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>
M48	Mitigation	<p><i>UAS Operator's <u>OM</u> – Flight operations: The UAS Operator's <u>OM</u> contains procedures, if required, to communicate with <u>Air Navigation Service Providers (ANSPs)</u> or other organisations responsible for the management of airspace.</i></p> <p><i>Procedures are also contained for the notification of the operational volume to other airspace users, as necessary, as described in <u>Aeronautical Information Publication (AIP) En-Route (ENR) section 1.1 – 4.1.8.</u></i></p>
	Assurance	<p>The implementation of procedures to communicate the operational volume to other aircraft and <u>ANSPs</u> reduces the likelihood of a mid-air collision.</p> <p>The UAS Operator has implemented methods of communication in the operational volume prior to commencing operations.</p> <p>The UAS Operator shall maintain records of the flights conducted, including communication methodologies between other UAS Operators, prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>

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M49	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations:</i> <i>The UAS Operator's <u>OM</u> contains emergency procedures to avoid and manage airspace incursions.</i></p>
	Assurance	<p>The implementation of a procedure to be performed in case of an emergency therefore reducing the likelihood of injury to an uninvolved person.</p> <p>The UAS Operator has implemented a set of instructions that must be performed in the case of airspace incursion.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures</p> <p>A RSMS is in place which monitors occurrences of aircraft incursions.</p>
M50	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations:</i> Flight path adjustment to accommodate unexpected movement of third parties (including third-party aggression) and to avoid breaching the 50m separation from uninvolved persons. The flight path adjustment should also prioritise safety of people over state of UAS and utilise any additional information (e.g., first-person video feed and/or crew communications).</p>
	Assurance	<p>The implementation of procedures to monitor the ground environment within the operational volume and adjustments to the aircraft flight path to deconflict the aircraft reduces the likelihood of a collision with an uninvolved person.</p> <p>The UAS Operator has implemented policies and procedures to deconflict the aircraft to make use of additional crew and/or video feeds.</p> <p>The UAS Operator shall maintain records of the flights conducted, including any methods of monitoring the ground environment, prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>

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M51	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations: The UAS Operator's <u>OM</u> contains procedures for determining the intended task feasibility, site permissions (landowners' permission), site assessment for extraordinary restrictions e.g. habitation, recreational activities and public access.</i></p>
	Assurance	<p>The implementation of procedures to assess the ground environment within the operational volume for restrictions and areas where an uninvolved person could be at an increased risk of collision will assist in planning a flight safely and reduce the likelihood of a collision with an uninvolved person.</p> <p>The UAS Operator has implemented procedures for the assessment of the ground environment within operational volume prior to commencing operations.</p> <p>The UAS Operator shall maintain records of the flights conducted, including the ground environment assessment, prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures due to ineffective procedures.</p>
M52	Mitigation	<p><i>UAS Operator's <u>OM</u> - Flight operations: The UAS Operator's <u>OM</u> emergency procedures - loss of separation distances to uninvolved third parties (emergency landing procedures).</i></p>
	Assurance	<p>The implementation of a procedure to be performed in case of an emergency therefore reducing the likelihood of injury to an uninvolved person.</p> <p>The UAS Operator includes a set of instructions that must be performed in the case of ground incursion.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must contain appropriate procedures.</p> <p>A RSMS is in place therefore monitoring occurrences of ground incursion.</p>

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<p>M53</p>	<p>Mitigation</p>	<p><u>RP Responsibilities (SPEC.060 Responsibilities of the RP):</u> <i>RP must not perform duties under the influence of psychoactive substances or alcohol or when they are unfit to perform their tasks due to injury, fatigue, medication, sickness or other causes.</i></p>
	<p>Assurance</p>	<p>The <u>RP</u> being appropriately fit to fly provides assurance that a degradation of human performance or failure should not occur.</p> <p>The <u>RP</u> is competent to self-assess prior to conducting planned operations.</p> <p>An <u>OM</u> is presented to the CAA upon request through ongoing oversight during the validity of the <u>OA</u> which must detail the crew health requirements.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>
<p>M54</p>	<p>Mitigation</p>	<p><u>RP Competence:</u> <i>When flying an unmanned aircraft within a horizontal distance of 50 metres from an artificial obstacle taller than 105 metres, the maximum height of the UAS operation may be increased up to 15 metres above the height of the obstacle at the request of the entity responsible for the obstacle.</i></p>
	<p>Assurance</p>	<p>Flights in close proximity to artificial obstacles presents an environment that limits the opportunity for a manned aircraft to be present therefore reducing the likelihood of a mid-air collision.</p> <p>A <u>RP</u> shall identify the maximum distance from the surface within the operational volume and maintain the aircraft within this and/or by setting the appropriate maximum height within the command unit.</p> <p>The UAS Operator shall maintain records of the flights conducted, including the identification of artificial obstacles within the operational volume, prior to the operation commencing for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot's key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>

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M55	Mitigation	<p><u>RP Competence:</u> <i>Pilot currency on similar and / or equivalent aircraft make and model (2 hours in 3 months).</i></p>
	Assurance	<p>A <u>RP</u> who is able to maintain key skills through training/practice and simulated emergencies is able to execute their duties effectively and reduce the likelihood of human error.</p> <p>A <u>RP</u> is required to maintain currency through live task and simulated operations including emergency operations training/practice utilising similar and/ or equivalent aircraft. Training/practice should be conducted in/for all types of weather conditions to maintain skills required for operating aircraft within the limits of applicable UAS as specified in manufacturer’s manuals.</p> <p>The UAS Operator shall maintain records of the flights conducted, including training/practice flights for a minimum of three years.</p> <p>A RSMS is in place which monitors occurrences where a pilot’s key skills and actions were not an effective mitigation for reducing the potential of human factors-related failures.</p>