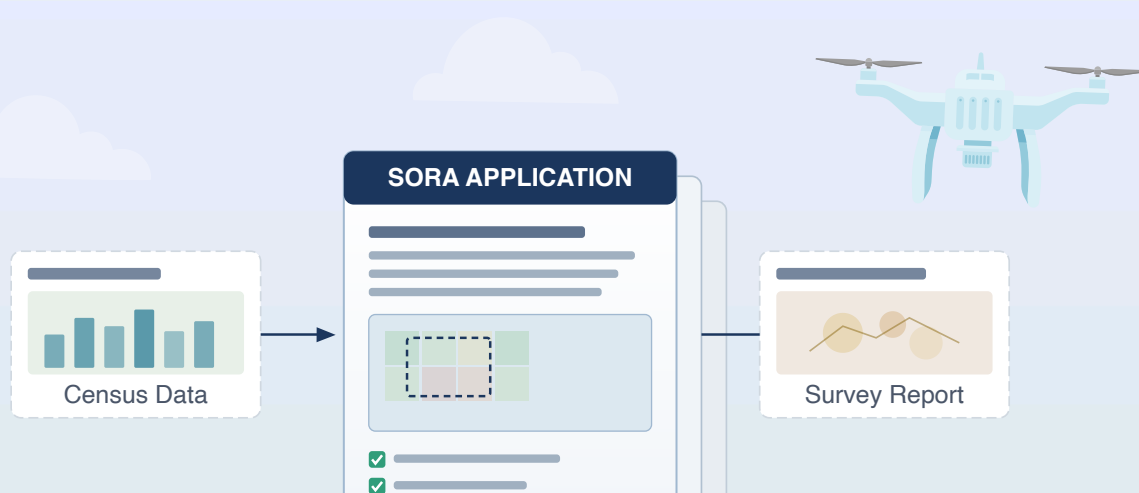


UK SORA Best Practice

Submission of Operational Details

CAP3239A



- › A best practice guide to help applicants submit Assessment 1 evidence in one consolidated document.
- › Following this guide ensures that submissions are easy to review and that each requirement is supported by clear, objective evidence.

⚠ When completing each section, focus on evidence, not a description of the intended approach. For example, rather than stating "we will use ONS data", provide the actual population density evidence that is being claimed, or a clear reference to it.

High-Level Process

A step-by-step guide to preparing and submitting your UK SORA Assessment 1 evidence:

General Advice

All documents and supporting evidence should be clearly version controlled, and date stamped, with consistent version/date identifiers shown within the document itself and reflected in the file names of the submission and any referenced attachments.

References

If an evidence item is addressed elsewhere in the submission, applicants should avoid duplication and instead provide a clear signpost to the section where it is fully evidenced. The completed document should be submitted with any referenced supporting material to demonstrate compliance in full.

1

Overview of Operation

Clearly describe the purpose of the proposed operation and what it is designed to achieve, along with the operational environment, airspace, and crew roles

2

Maximum Distance of VLOS or BVLOS VM Operations

Provide evidence to justify the maximum operating distance and how the aircraft will remain safely monitored throughout the flight

3

Rotary Wing Swarm Operations – Visual Line of Sight

If applicable, explain the swarm concept and provide evidence that the operation can be conducted safely within VLOS

4

Make and Model of Unmanned Aircraft (UA)

Identify the aircraft to be used and provide the technical and performance evidence needed to support the application

5

Operational Volume and Ground Risk Buffer

Show how the flight volume, contingency volume, and ground risk buffer have been calculated for the operation

6

Maximum Population Density of the iGRC Footprint

Provide evidence for the highest population density within the iGRC footprint to support the iGRC determination

7

Average Population Density of Adjacent Area

Provide evidence for the average population density in the adjacent area and any nearby assemblies of people where applicable

8

Dangerous Goods

If relevant, provide evidence describing any dangerous goods carried and how the associated risks will be managed

9

Dropping of Articles

If relevant, provide evidence showing that any dropping or delivery activity is controlled and can be conducted safely

10

Ground Risk Mitigations

Provide evidence for any mitigations claimed to reduce the intrinsic ground risk class to the final ground risk class

11

Claiming a Lower Air Risk Class (ARC)

Explain and evidence any strategic mitigations being used to reduce the initial ARC to a lower residual ARC

12

Atypical Air Environment

Define the AAE being claimed and provide evidence that the operation will remain within it under the required controls

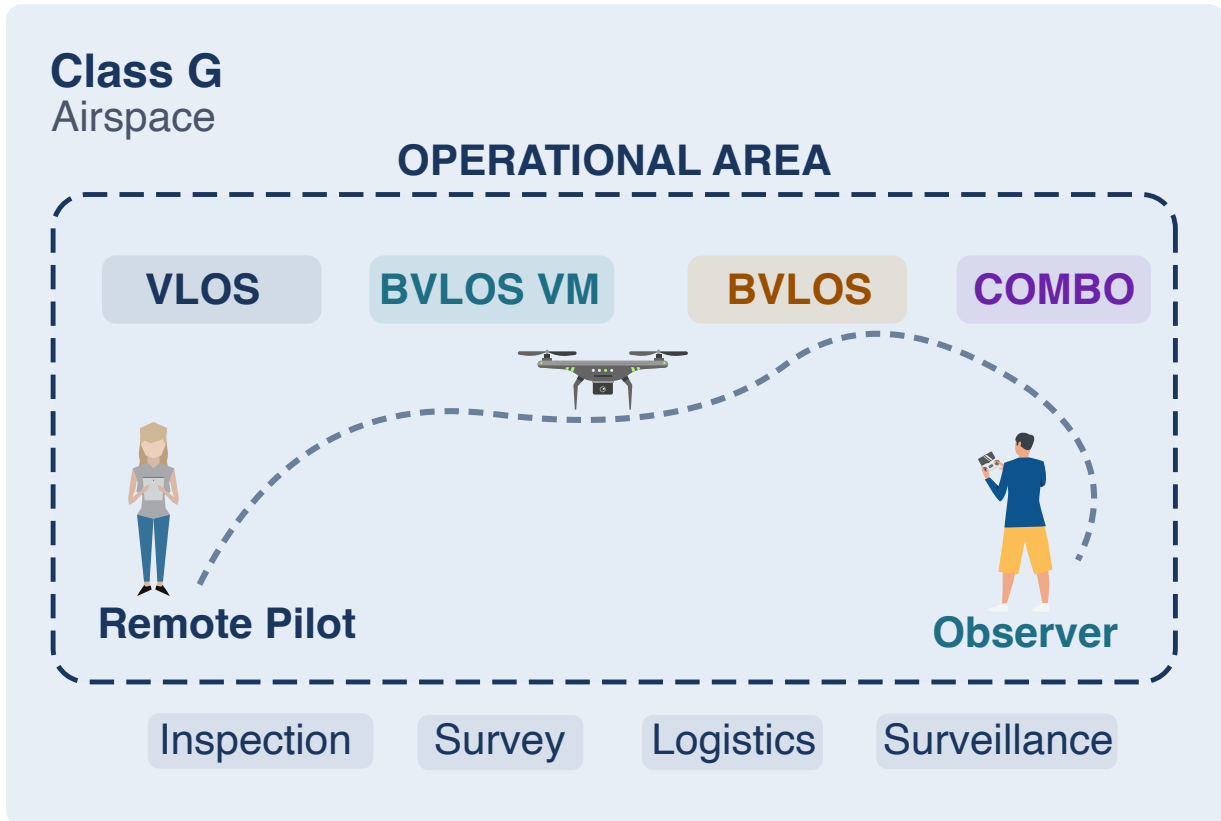
13

Strategic Mitigations (SM) for Claiming a Lower Residual ARC

Provide evidence for the specific strategic mitigations relied on to justify a lower residual ARC

1 Overview of Operation

Clearly describe the purpose of the proposed operation and what it is designed to achieve, along with the operational environment, airspace, and crew roles



Operation Description

This section should provide a clear, concise description of the proposed operation. Applicants must provide details of the proposed operation, and include operation specific information such as the type of operation (VLOS, BVLOS VM, BVLOS or combination), a description of the operation, and the class of airspace to be operated in. It should also clearly state whether the application is for a test site, and whether it is being progressed under CAP3145.

What to Include

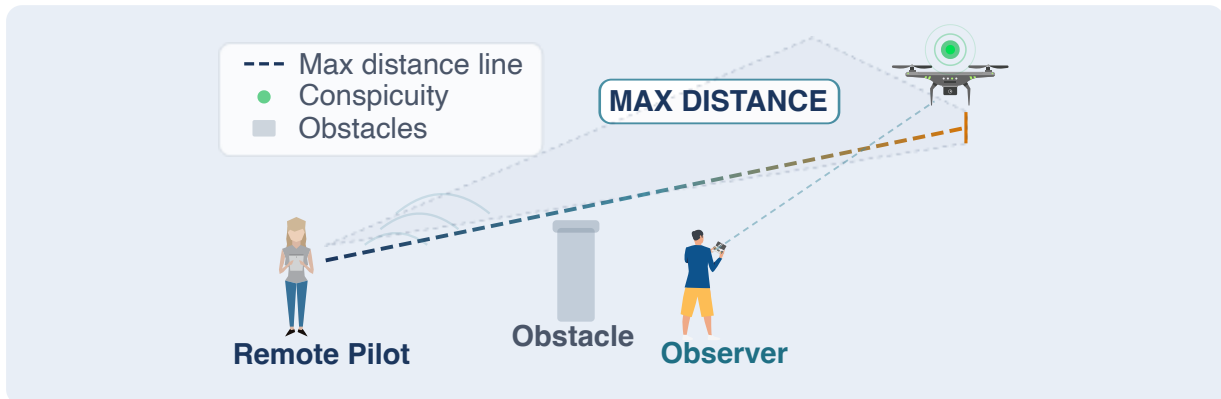
- › Description of the operation
- › Type of operation (VLOS, BVLOS VM, BVLOS or combination)
- › Industry sector (e.g., inspection, survey, logistics, surveillance)
- › Area of operation including urban / rural / industrial / commercial, etc
- › Whether it is single-site, multi-site, or UK wide (repeatable model across locations)
- › A generic location application must include a minimum of three example locations / operation plans
- › Information regarding Test Site applications (if applicable)
- › Class(s) of airspace
- › Example flight plan within the flight volume
- › Crew roles and responsibilities

Key Requirement

Applicants must provide details of the proposed operation, and include operation specific information such as the type of operation (VLOS, BVLOS VM, BVLOS or combination), a description of the operation, and the class of airspace to be operated in.

2 Maximum Distance of VLOS or BVLOS VM Operations

Provide evidence to justify the maximum operating distance and how the aircraft will remain safely monitored throughout the flight



Evidence to Support

Provide evidence to justify the maximum range claimed between the Remote Pilot (RP) and the Unmanned Aircraft (UA) and where applicable, any observer(s) used for the VLOS / BVLOS VM operation.

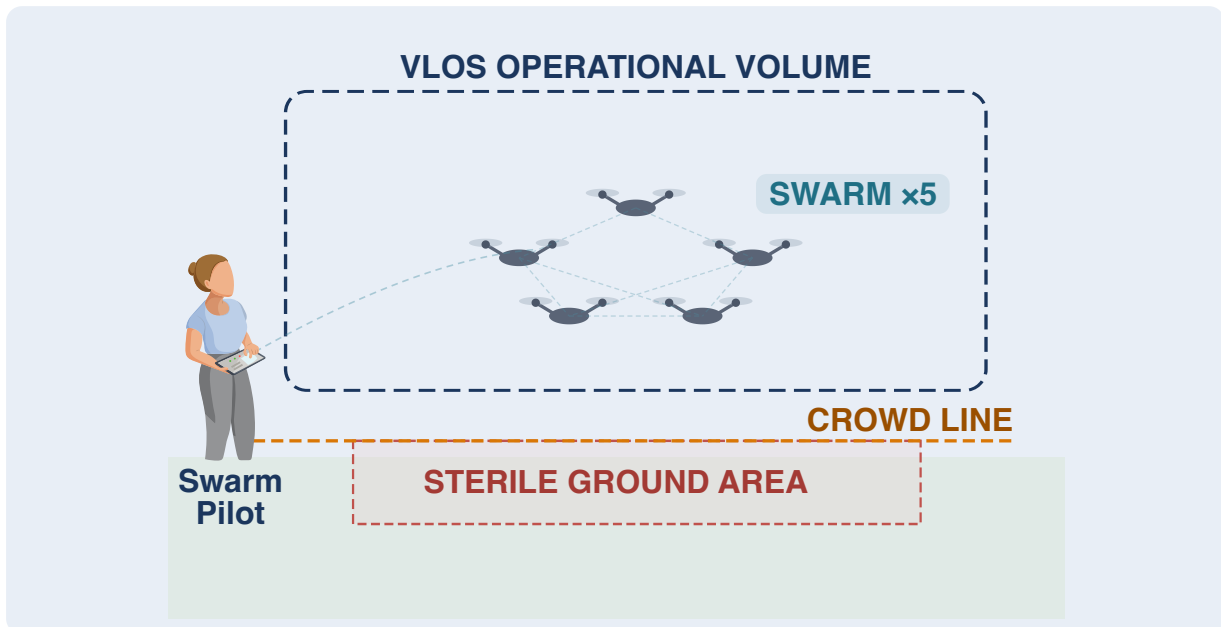
- › BVLOS Visual Mitigation (VM) method, including the maximum distance from the RP
- › How the maximum distance has been calculated
- › How the UA will be monitored during the flight
- › How the orientation can be reliably determined
- › How the UA remains clearly visible in the operational volume
- › How separation from obstacles can be assessed and monitored
- › Crew roles/responsibilities, communications method, phraseology, loss of communication actions
- › Aircraft conspicuity evidence, including the UA's size, colour, contrast, lighting, markings, and any electronic conspicuity or tracking aids used

Best Practice Tip

Focus on evidence, not a description of the intended approach. Provide the actual calculations, test results, or documentation that demonstrate the maximum distance is safe and achievable.

3 Rotary Wing Swarm Operations – Visual Line of Sight

If applicable, explain the swarm concept and provide evidence that the operation can be conducted safely within VLOS



Swarm Operations Overview

If you propose swarm operations (i.e., more than one UA controlled collectively), you must clearly describe the swarm concept and submit evidence that the operation can be conducted safely within VLOS, with defined volumes, crew roles and procedures scaled to the number of aircraft. When submitting your application, you will still need to submit evidence for all the steps outlined in this guidance.

Information & Evidence – Part 1

- › Full description of the proposed operation
- › Operating procedures
- › Procedure to issue a NOTAM
- › Containment measures to stop overflight of uninvolved third parties
- › Details of how a sterile ground area will be established and maintained
- › How the crowd line will be established and monitored outside the sterile ground area for the operation

Information & Evidence – Part 2

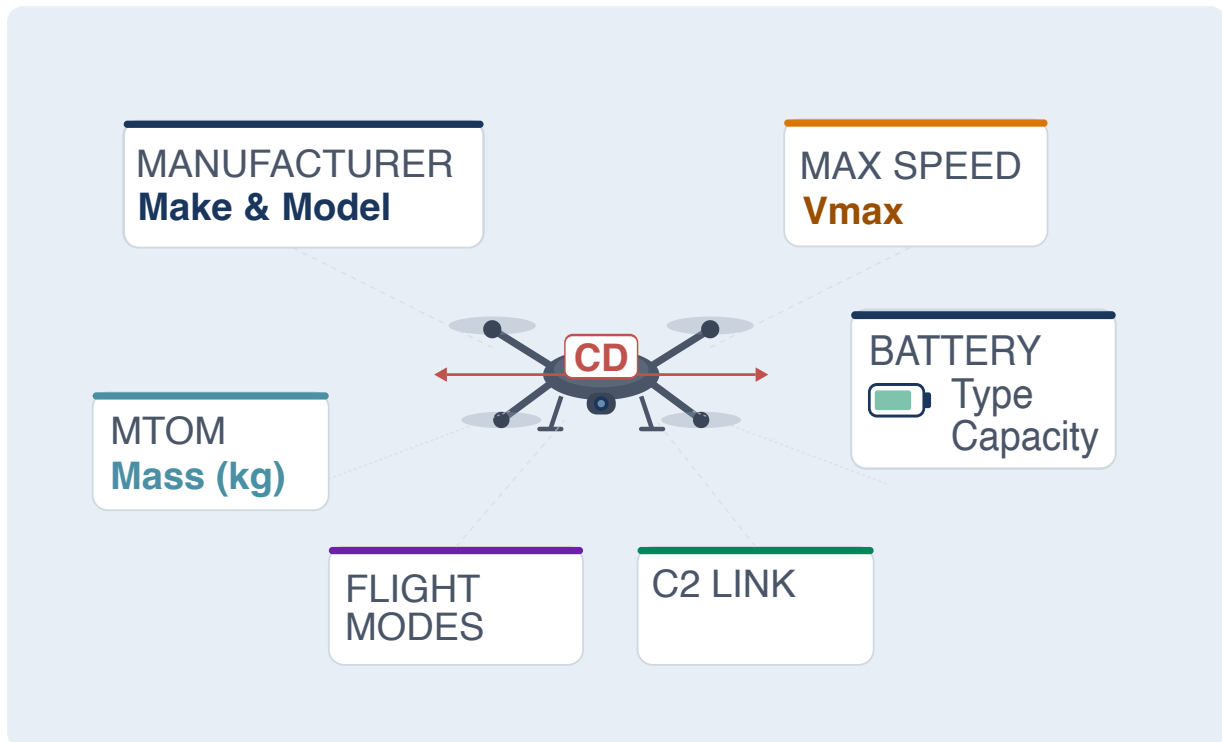
- › Crew roles and responsibilities
- › How the go/no-go and abort criteria will be initiated and carried out
- › Flight termination procedure
- › Emergency Response plan
- › Safety Risk Assessment for the use of Pyrotechnics on the UA (if applicable)
- › Any additional information required as per CAP722E

Applicability

This step applies only if you propose swarm operations (i.e., more than one UA controlled collectively). If not applicable, you may skip this section.

4 Make and Model of Unmanned Aircraft (UA)

Identify the aircraft to be used and provide the technical and performance evidence needed to support the application



Overview

Applicants should identify exactly which UA will be used for the operation and provide sufficient technical detail and evidence for the assessor to understand the aircraft's capabilities, limitations, and configuration(s).

This should include clear evidence of the UA's characteristic dimension (size), measured and presented in accordance with AMC1 to Article 11 Conducting a UK Specific Operation Risk Assessment (UK SORA), 1.61 (i) - Determining the UA characteristics. Evidence of the UA's maximum speed should also be submitted. In most cases this is defined as the maximum possible airspeed the UA may achieve, as specified by its Designer. It is important to note that this refers to the potential maximum speed, not the maximum speed of the proposed operation.

UA Identification

For each UA you intend to use provide:

- › **Manufacturer** (make)
- › **Model name and variant**, including any sub-variant
- › **Serial number(s)** (or how you will manage/record serials if you have multiple UA)
- › **Firmware/software version(s)** relevant to flight control and safety functions
- › Any **class marking** (e.g., UK0–UK6 / or EU C-class where applicable) and how it is evidenced

Key Technical & Performance Characteristics

- › Manufacturer technical specification sheet/manual
- › MTOM in the stated configuration
- › UA's characteristic dimension (CD)
- › Maximum speed as defined by the designer
- › Flight modes used (positional, attitude, manual, waypoint, RTH, etc.)
- › Navigation positioning dependencies (GNSS etc.)

Additional Technical Details

- › How the UA remains clearly visible in the operational volume.
- › Which UA has an EC In/Out device even if using an EC out and not claiming under a TMPR.
- › Command & control link type(s) and any declared limitations.
- › Payload type(s) and mass (and whether payload changes will occur).
- › Batteries used (type/capacity) and any battery management constraints.



Key Requirement

Evidence of the UA's maximum speed should be submitted. In most cases this is defined as the maximum possible airspeed the UA may achieve, as specified by its designer - not the maximum speed of the proposed operation.



Maximum Speed

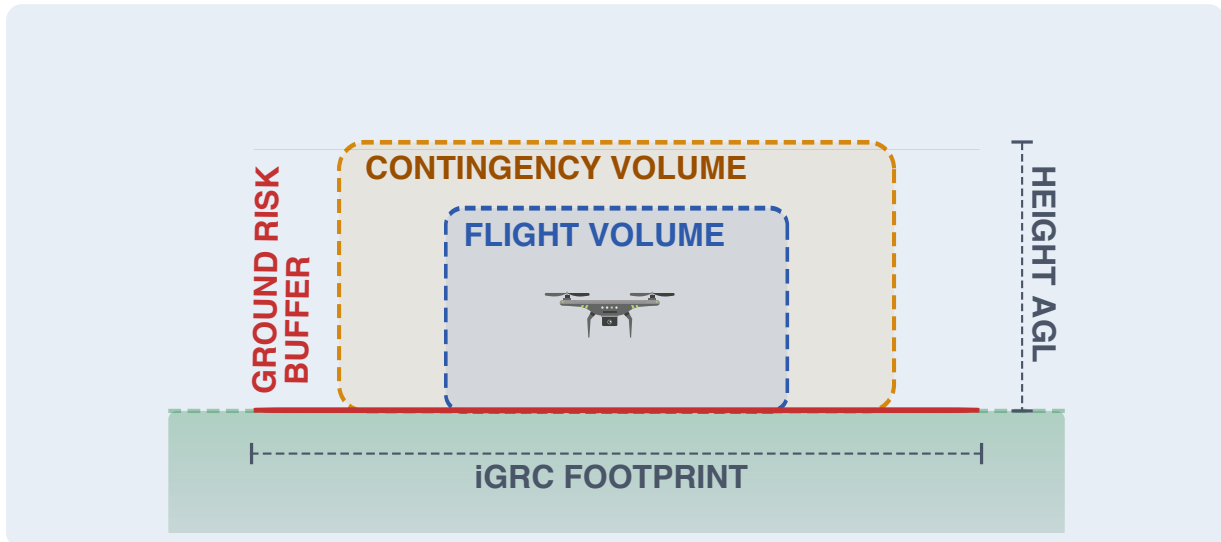
If a maximum speed less than that defined by the designer is being claimed, applicants should also provide evidence of the following:

- ✓ The reduced maximum speed is enabled through a designer-supported configuration change
- ✓ The configuration and procedure for selecting the reduced maximum speed are clearly described in the relevant technical documentation
- ✓ The operator has documented procedures for configuring and verifying the reduced maximum speed for the specific operation
- ✓ The relevant configuration or mode is selected and controlled prior to take-off
- ✓ The UA will maintain the selected reduced maximum speed throughout the operation
- ✓ Appropriate procedures are in place to address any failure of the reduced maximum speed restriction

The CAA may request additional evidence where necessary to verify the robustness of the speed limitation and the associated procedures.

5 Operational Volume and Ground Risk Buffer

Show how the flight volume, contingency volume, and ground risk buffer have been calculated for the operation



What to Demonstrate

The applicant should provide clear evidence showing how the operational volume (flight volume plus contingency volume) has been calculated and the associated ground risk buffer (GRB) for the proposed operation. The intent is to demonstrate that the operation is planned and bounded in a way that supports the ground risk assessment and containment expectations. If the applicant intends to use a reduced operational speed for Operational Volumes and GRB calculations, the applicant will need to provide justification and supporting evidence.

Evidence You Should Provide

- ✓ Identify the flight volume (vertical and horizontal)
- ✓ Clarify that it is the maximum intended flight volume (not an example height for the specific location)
- ✓ Calculate the contingency volume (vertical and horizontal)
- ✓ Calculate the initial ground risk buffer
- ✓ Supply iGRC overlay map/.kml file(s)
- ✓ If using more than one location a KML/KMZ file is required for each location

Volume Layers

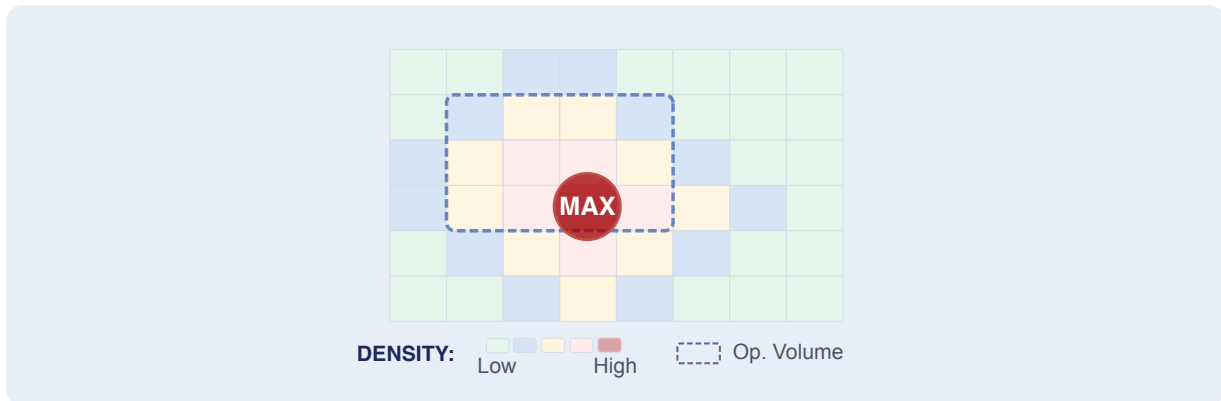
- › **Flight Volume (FV)** – The volume in which the UA conducts normal operations using standard operating procedures, remaining within defined operational boundaries at all times.
- › **Contingency Volume (CV)** – The volume surrounding the Flight Volume. Entry into the Contingency Volume is considered an abnormal situation, requiring the execution of contingency procedures to return the UA to the Flight Volume.
- › **Ground Risk Buffer (GRB)** – The ground area surrounding the footprint of the Contingency Volume. In the event of a loss of control of the operation, the UA is expected to end its flight within the Ground Risk Buffer.

Best Practice Tip

Use KML/KMZ files to overlay and visualise operational volumes on maps. If using more than one location, a separate KML/KMZ file is required for each location.

6 Maximum Population Density of the iGRC Footprint

Provide evidence for the highest population density within the iGRC footprint to support the iGRC determination



Population Density Evidence

This section should provide evidence for the maximum population density within your iGRC footprint. Applicants must identify the iGRC footprint (flight volume + contingency volume plus initial GRB) and then identify the maximum population density within that footprint to determine the iGRC.

Evidence You Should Provide

- Evidence to support claimed maximum population density value within the footprint
- Controlled Ground Area (if applicable)
- Which dataset/map you used
- The grid size/resolution (appropriate to your operation)
- How you derived the maximum value inside the footprint

Best Practice Tip

Refer to the CAA Population Density Best Practice Guide for detailed guidance on selecting data sources, calculating maximum population density, and documenting your methodology.

7 Average Population Density of Adjacent Area



Provide evidence for the average population density in the adjacent area and any nearby assemblies of people where applicable



Adjacent Area Evidence

This section should provide evidence for the average population density in the adjacent area, and evidence relating to assemblies of people within 1 km of the operational volume (as applicable). This information is used to set operational limitations and to determine the required containment robustness.

Evidence You Should Provide

-  Evidence for calculating population density of the adjacent area
-  Assemblies of people within 1 km of the operational volume

Important Note

If the GRB is larger than the adjacent area, containment requirements do not apply. If the UA is $\leq 250g$, there is no requirement to account for the population in the adjacent area.

8 Dangerous Goods

If relevant, provide evidence describing any dangerous goods carried and how the associated risks will be managed



DG
Classification



RA
Risk
Assessment



Packaging

+ Submit Form SRG2807 separately

Dangerous Goods Overview

If applicable to the operation, please provide evidence describing any Dangerous Goods (DG) to be carried as payload, and demonstrate that the associated risks are identified and mitigated appropriately. Applicants should submit a separate application form SRG2807 (Transport of dangerous goods and munitions of war | Civil Aviation Authority (caa.co.uk) along with the proof of payment of the associated fee in accordance with Official Record Series 5 – Scheme of Charges for Air Operators and Police Operators.

What You Need to Submit

- ✓ Full description of the dangerous goods to be carried
- ✓ Dangerous Goods class
- ✓ Quantity to be carried per flight
- ✓ Provide a Dangerous Goods specific risk Assessment
- ✓ Provide an Emergency Response plan
- ✓ Provide a Dangerous Goods Procedure manual
- ✓ Packaging and containment used (any risk to third parties may be mitigated by the use of a crash protected container and following the ICAO Technical Instructions)

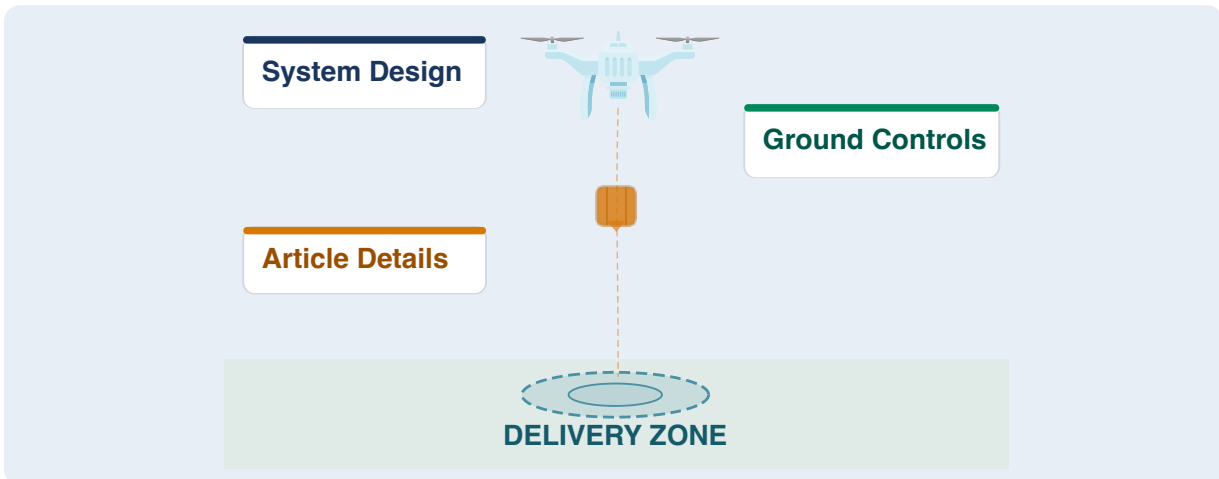


Key Requirement

Applicants should submit a separate application form SRG2807 along with the proof of payment of the associated fee in accordance with Official Record Series 5.

9 Dropping of Articles

If relevant, provide evidence showing that any dropping or delivery activity is controlled and can be conducted safely



Dropping/Delivery Evidence

If applicable, please provide evidence supporting any operation where the UA will drop, release, project, lower, dispense, or otherwise deliver an article/substance while in flight.

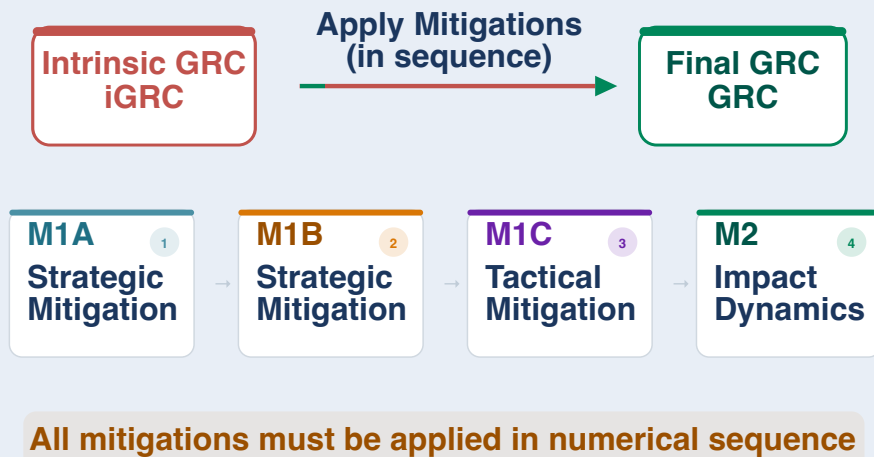
- What is being released (article/substance type, dimensions, mass, packaging/container)
- Evidence that the dropping activity is controlled and safe
- Provide system design evidence (release system)
- Release mechanism description, and installation configuration
- Evidence of positive retention (i.e., cannot release unintentionally)
- Evidence of command integrity
- Provide operational procedures
- Provide what ground risk controls are in place

Applicability

This step applies only if the UA will drop, release, project, lower, dispense, or otherwise deliver an article/substance while in flight. If not applicable, you may skip this section.

10 Ground Risk Mitigations

Provide evidence for any mitigations claimed to reduce the intrinsic ground risk class to the final ground risk class



|| Ground Risk Mitigations Overview

In this step the applicant provides evidence for any ground risk mitigations being claimed to reduce the intrinsic Ground Risk Class (iGRC) to a final GRC. All mitigations **must** be applied in numerical sequence. Evidence will need to support claimed mitigations at the relevant robustness level and/or RAE(F) Flight Worthiness Reports (If applicable).

Annex B to Article 11 provides the integrity and assurance requirements for the applicant's proposed mitigations. Where a mitigation has multiple criteria, all applicable criteria must be met for the chosen robustness level (unless stated otherwise).



Common Cause of Rejection

Applicants should not apply mitigations where the iGRC cannot be reduced further and do not change the SAIL outcome. This is a common cause of rejection due to invalid or unnecessary mitigations.

M1A – Strategic Mitigation – Sheltering

Provide evidence for sheltering mitigations claimed to reduce the intrinsic Ground Risk Class.

M1B – Strategic Mitigation Using Operational Restrictions

Provide evidence for operational restriction mitigations claimed to reduce the intrinsic Ground Risk Class.

M1C – Tactical Mitigations – Ground Observations

Provide evidence for ground observation mitigations claimed to reduce the intrinsic Ground Risk Class.

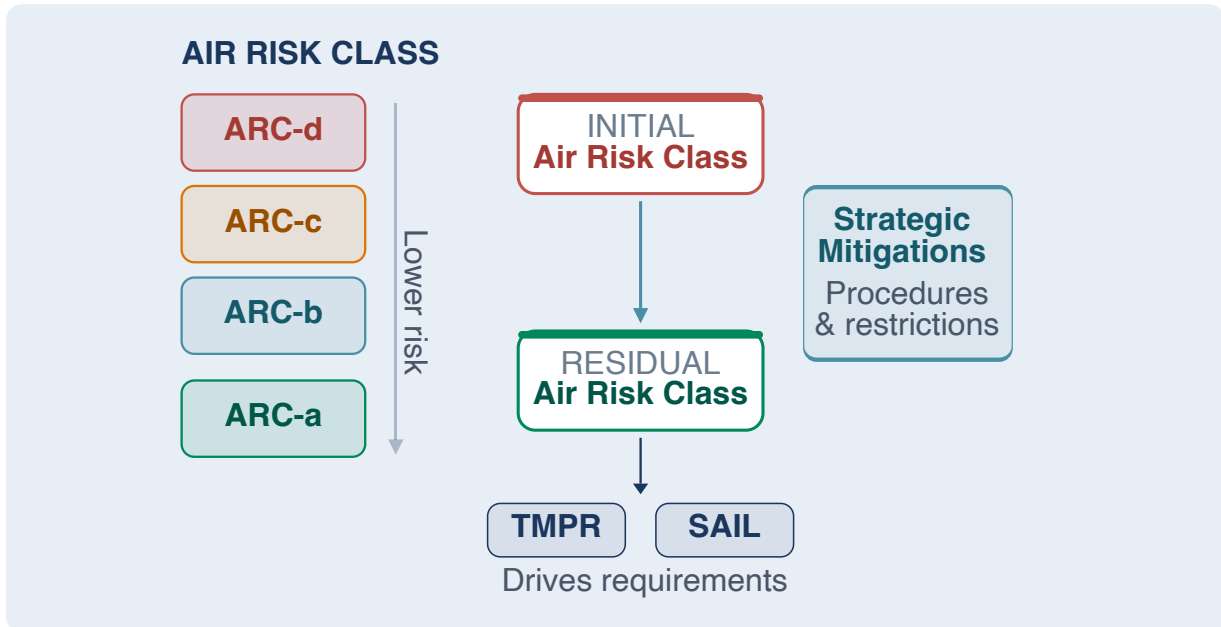
M2 – Effects of UA Impact Dynamics Are Reduced

Provide evidence that the effects of UA impact dynamics are reduced, supporting the claimed mitigation.

11

Claiming a Lower Air Risk Class (ARC)

Explain and evidence any strategic mitigations being used to reduce the initial ARC to a lower residual ARC



Air Risk Class Reduction

In this section the applicant describes how the initial ARC can be reduced to a lower residual ARC using strategic mitigations. The UK SORA process allows strategic mitigations (procedures and operational restrictions applied before take-off) to reduce the initial ARC into a residual ARC, which then drives TMPR and SAIL.

For VLOS operations the initial air risk class may be reduced by one class. This may only be reduced to a minimum of ARC-b. The applicant will need to provide evidence for its justification.



Information & Evidence You Should Provide

- ✓ What your Initial Air Risk Class is
- ✓ The residual Air Risk Class you are claiming
- ✓ Which strategic mitigations you will be claiming and explain how they reduce collision risk

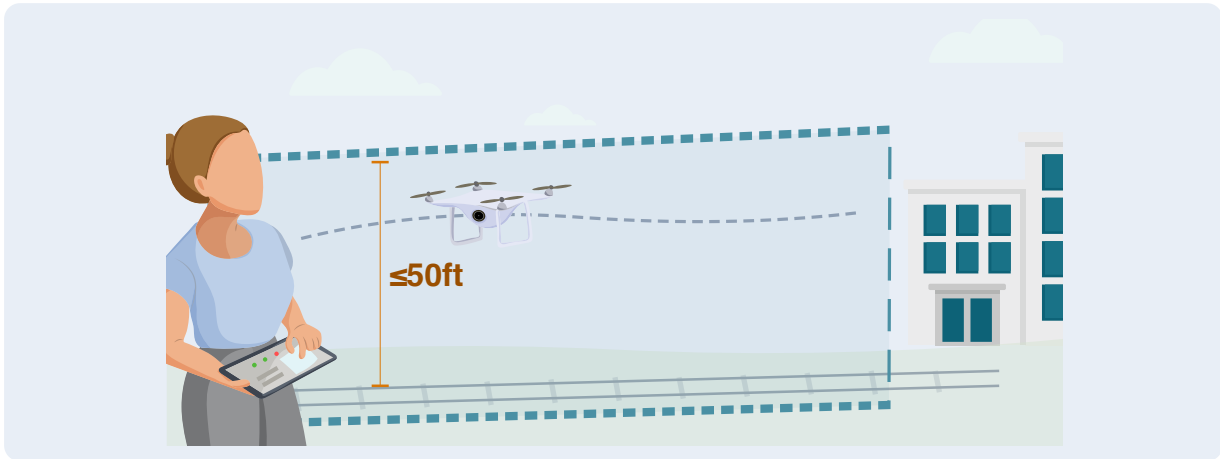


VLOS Limitation

For VLOS operations the initial air risk class may be reduced by one class. This may only be reduced to a minimum of ARC-b.

12 Atypical Air Environment





Define the AAE being claimed and provide evidence that the operation will remain within it under the required controls



Atypical Air Environment

In this section, applicants should clearly define the AAE volume they are claiming and explain the type of operation to be carried out (e.g., proximity to buildings or linear structures, or operations confined to private property at low height) and provide supporting evidence and controls showing the operation will remain within those limits.

Evidence You Should Provide

-  Define the AAE operational volume, including AAE geometry and vertical limits
-  Evidence that the operation meets one (or more) AAE proximity characteristics
-  Evidence of controls that keep the aircraft inside the AAE volume
-  Reference to CAP3040 alignment (where used)

Best Practice Tip

CAP3040 contains further guidance on characterising Atypical Air Environments. Ensure your evidence clearly demonstrates alignment with the relevant AAE criteria.

13 Strategic Mitigations (SM) for Claiming a Lower Residual ARC

Provide evidence for the specific strategic mitigations relied on to justify a lower residual ARC

STRATEGIC MITIGATIONS – Initial ARC → Residual ARC



Strategic Mitigations Overview

Strategic mitigations are the pre-flight procedures and operating limits you put in place to reduce that risk by limiting where/when you fly, reducing how long you are exposed, or operating where fewer crewed aircraft are likely to be present. Applying these mitigations can reduce the Initial ARC to the residual ARC.

Key Requirement

Each strategic mitigation claimed must be supported by evidence demonstrating that it effectively reduces the air risk. Evidence should be specific to your operation, not generic descriptions.

📍 **SM1 – Operational Restriction by Boundary**

- › A clearly defined boundary limited operating volume (lateral/vertical limits) and how it is enforced
- › Airspace characterisation for that volume: traffic types, typical routes/altitudes; activity/density/encounter rates, and surveillance coverage
- › Explanation of why that evidence supports a lower encounter expectation than the generalised flowchart assumption

📅 **SM2 – Operational Restriction by Chronology**

- › A defined operating time window and how it will be applied and controlled in procedures
- › Evidence that encounter rate is lower during that window

📅 **SM3 – Operational Restriction by Time of Exposure**

- › A clear exposure time definition
- › Controls that enforce the limited exposure
- › Evidence to show how a reduced exposure time will lower encounter likelihood

SM4 – Special Use Airspace (SUA)

- › Special Use Airspace definition and applicability
- › The SUA identifier name, horizontal/vertical limits and published description
- › Include evidence that the Operational Volume is contained within the SUA structure (AGL volume vs AMSL Airspace structure)
- › Evidence the SUA will be allocated/active for your operating window and your activation verification procedure
- › Any associated Airspace Change Process (ACP) should be submitted
- › Published DA/TDA details and its activation schedule/process
- › Your procedures for operating under the TSA conditions
- › For TRA specifically, include the ANSP ruleset – transit conditions, equipage, traffic type/density restriction
- › Formal ANSP agreement and operating procedures that make those controls reliable in practice

SM5 – Other Airspace Requirements

- › The published TMZ/RMZ details
- › A map/.kml overlay showing your operational volume is within the TMZ/RMZ
- › TMZ transponder/electronic conspicuity requirements
- › RMZ radio communication requirements
- › Evidence of the risk reduction mechanism you are claiming

SM6 – Pre-agreement of Any ANSP Services

- › A clear description of the ANSP service you're relying on and the limitations
- › Evidence of a pre-agreement with the relevant ANSP
- › Approved operating and ANSP procedures
- › How the ANSP ensures the area remains free from conflicting traffic during the operation
- › Your procedures for immediate action if conflicting traffic is detected
- › Exactly what traffic information is provided and how it is communicated
- › Deconfliction service criteria

SM7 – Pre-agreement of Any UTM Services

- › Submission of the formal pre-agreement with the UTM provider
- › Description of the UTM service(s) relied upon (geo-consciousness, traffic information; trajectory deconfliction, conformance monitoring/alerting, conflict monitoring/alerting)
- › Evidence of the service provider commitment/arrangement and how the service will be used operationally (interfaces, roles/responsibilities, communications, etc.)
- › Evidence that the service performance is adequate and available for the duration of the operation, proportionate to how safety-critical it is to your residual ARC claim

SM8 – NOTAM of Intended Operation

- › An explanation to why the operation merits a NOTAM
- › Evidence of how it changes risk (the residual ARC justification)
- › Evidence of procedures and controls
- › NOTAM content to be published

SM9 – Military Low Flying Notification

- › Description of the planned operation and encounter risk
- › Evidence of a CANP process and compliance with AIP ENR 1.10
- › Evidence of operational controls and limitations

SM10 – Outreach to Local Flying Clubs and Pilots

- › Evidence of an agreement with the relevant flying club
- › Outreach/coordination plan and implementation process
- › Operational procedures